

SMALL MANUFACTURING AND THE CHALLENGES OF THE NEW MILLENNIUM

HEARING BEFORE THE SUBCOMMITTEE ON TECHNOLOGY OF THE COMMITTEE ON SCIENCE HOUSE OF REPRESENTATIVES ONE HUNDRED SIXTH CONGRESS FIRST SESSION

SEPTEMBER 23, 1999

Serial No. 106-43

Printed for the use of the Committee on Science



U.S. GOVERNMENT PRINTING OFFICE

WASHINGTON : 1999

60-971

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SMALL MANUFACTURING AND THE CHALLENGES OF THE NEW MILLENNIUM

THURSDAY, SEPTEMBER 23, 1999

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE,
SUBCOMMITTEE ON TECHNOLOGY,
Washington, DC.

The Subcommittee met, pursuant to notice, at 1:00 p.m. in room 2318, Rayburn House Office Building, Hon. Constance Morella [chairwoman of the Subcommittee] presiding.

Chairwoman MORELLA. I'm going to call our Subcommittee, the Technology Subcommittee of the Science Committee, to order. As we begin, I want to thank you for coming to our hearing on small manufacturing and the challenges of the new millennium.

If I had to guess, most Americans probably don't stop to think about the daily impact that small manufacturing has on our lives. And yet it's all but impossible to get through a day without using products created by small manufacturers. All we need to do is look around our hearing room today to realize just how much we depend on the work of small manufacturers. Everything from the clothes we wear to the chairs we sit on to the computer equipment that we use to broadcast this hearing live on the Internet can be attributed in part to the products of small manufacturers.

Small manufacturers make up over 95 percent of all United States manufacturers, employ one out of every ten American workers. It's not surprising, then, that small manufacturers contribute so greatly to our Nation's economic growth and prosperity.

In recognition of this vital sector of our economy, 1999 has been declared the year of the small manufacturer. From Pennsylvania and Maine to Nebraska and Tennessee, small manufacturers have gathered across the country in state-wide celebrations. And yesterday, we welcomed hundreds of small manufacturers to the National Manufacturing Summit held here in Washington. This is the defining event of this year-long celebration.

The National Summit was orchestrated to bring together leaders from industry, government and academia in order to explore the challenges and opportunities facing America's small manufacturers in the next decade and to develop action that will enable a vital sector of our economy to prosper well into the 21st century.

Four of the major challenges addressed by participants of the National Summit included electronic commerce, international trade, work force development and sustainable manufacturing. We're convening this hearing today in conjunction with the National Summit. This hearing seeks to review the findings of the Summit and

discuss the appropriate role of the Federal Government in helping small manufacturers excel in the four areas I just mentioned and to be able to remain competitive in the years to come.

One Federal program that's assisted small manufacturers is the National Institute of Standards and Technology's Manufacturing Extension Partnership, or MEP. MEP, through a national network of locally operated centers, provides small manufacturers with cost-effective access to a variety of services, ranging from financial planning and product development to quality management and human resource direction.

Last May, I introduced H.R. 1744, the National Institute of Standards and Technology Act of 1999, which authorizes the NIST MEP program at \$106.8 million for fiscal years 2000 and 2001. This amount is about \$7 million above the Administration's fiscal year 2000 request for MEP.

The MEP program does have a significant amount of support among members of the Science Committee, and indeed, my colleague, the Ranking Member, is a strong supporter, as is Ms. Stabenow.

Today we would like to examine MEP's effectiveness in helping small manufacturers remain competitive. And we also want to explore ways that MEP can be improved so that it would reach more small manufacturers without significantly expanding the current number of MEP centers.

[The statement of Mrs. Morella follows:]

Statement of
Chairwoman Constance A. Morella
Subcommittee on Technology
Committee on Science

Small Manufacturing and the Challenges of the New Millennium

*Thursday, September 23, 1999
1:00 p.m. to 3:00 p.m.
2318 Rayburn House Office Building*

Thank you all for coming to our hearing on Small Manufacturing and the Challenges of the New Millennium.

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From Pennsylvania and Maine to Nebraska and Tennessee, small manufacturers have gathered from across the country in statewide celebrations.

And yesterday, we welcomed hundreds of small manufacturers to the National Manufacturing Summit held here in Washington, the defining event of this year-long celebration.

Small Manufacturing and the Challenges of the New Millennium
Statement of Chairwoman Constance A. Morella
Subcommittee on Technology
Committee on Science
September 23, 1999

The National Summit was orchestrated to bring together leaders from industry, government, and academia in order to explore the challenges and opportunities facing America's small manufacturers in the next decade, and to develop actions that will enable this vital sector of our economy to prosper well into the 21st Century.

Four of the major challenges addressed by participants of the National Summit included Electronic Commerce, International Trade, Workforce Development, and Sustainable Manufacturing.

We are convening this hearing today in conjunction with the National Summit.

This hearing seeks to review the findings of the Summit and discuss the appropriate role of the federal government in helping small manufacturers excel in the four areas I have just mentioned and to remain competitive in the years to come.

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And we also want to explore ways that MEP can be improved to reach more small manufacturers without significantly expanding the current number of MEP centers.

We have a distinguished panel of witnesses with us here today to share their thoughts on the future of small manufacturing.

I look forward to their testimony.

Chairwoman MORELLA. We have a distinguished panel of witnesses with us today to share their thoughts on the future of small manufacturing, and I thank them very much for being here. I look forward to their testimony, and I want to recognize the very distinguished, hard-working Ranking Member of the Subcommittee for his opening statement, Mr. Barcia.

Mr. BARCIA. Thank you very much, Chairwoman Morella. And I want to join you in welcoming our distinguished panel to this afternoon's hearing. I especially want to thank our two small business panelists for taking time away from their companies to travel to Washington, D.C. to help advise this Subcommittee about the Manufacturing Extension Partnership and the challenges facing small manufacturers today.

When the Manufacturing Extension Partnership was first established, small manufacturers were struggling to compete against offshore manufacturers. The MEP was conceived as a public-private partnership to assist our small businesses in meeting global competitive challenges, and it has been very successful. The Michigan Manufacturing Technology Center in my home state of Michigan has assisted hundreds of small and medium size manufacturers throughout the State of Michigan by providing training and assistance in a broad array of areas, such as quality assurance, lean manufacturing techniques, performance benchmarking and environmental management.

In Michigan, where many small and medium size manufacturers are a part of the auto industry supply chain, these second and third tier suppliers must be competitive with companies around the world. By working with the Michigan Manufacturing Technology Center, they are. Now the challenges facing small manufacturers are changing. They still have to compete in a global marketplace, but they also face new challenges. Small business must become Internet literate, because more and more business transactions are occurring over the Internet.

If small manufacturers want to remain competitive, and be a part of the supply chain, they must adopt these new ways of doing business. Along with adopting new technologies, small businesses need a technically literate work force. Whether hiring new employees or providing professional development, small manufacturers must ensure that their employees have the skills to integrate these new technologies into the workplace.

Finally, small manufacturers not only need to be competitive with imports in the United States, they need to be aggressive as exporters. These are just a few of the new challenges facing our small and mid-sized manufacturers. I want to commend the Modernization Forum, the National Association of Manufacturers, and the Manufacturing Extension Partnership for organizing the National Manufacturing Summit for small and medium manufacturers. This Summit was the first step in formulating a policy to address the challenges facing our small manufacturers.

Again, I want to thank our distinguished panel for appearing before the Subcommittee, thank our Chair, our distinguished Chair, Chairwoman Morella, for this timely hearing and the opportunity for these panel guests to share their insight and their expertise with us as we hope to chart the future of our efforts here in the

Congress at assisting small and medium size manufacturing businesses.

With that, I look forward to listening to all of your comments. Thank you, Madam Chair.

Chairwoman MORELLA. That you, Mr. Barcia. When I introduce the panelists, I will let you introduce your constituent from Saginaw.

I'm pleased to recognize Ms. Stabenow from Michigan.

Ms. STABENOW. Thank you, Madam Chair. I join with both of you in welcoming our speakers today and particularly Norm Braddock from the great State of Michigan. I'll join Mr. Barcia in welcoming him. I know first-hand that he has tremendous experience in economic development and working with small manufacturers in Michigan, also working with the auto industry and with the MEP program. So we're extremely pleased to have you here with us as well as the other panelists.

I'm interested in the same kinds of issues that have been talked about by our Chairwoman and Ranking Member, extremely interested, in addition to the issue of technology in the classroom. Yesterday we had a hearing addressing issues of barriers to bringing technology to the classroom. I know that work force development, education, are critical to small and large manufacturers and certainly welcome your thoughts in that area as well as other issues related to technology, e-commerce, what we're doing in terms of support and technology for our small manufacturers.

I am, as has been indicated, a strong supporter of the MEP program. I do want to also indicate I am a strong supporter of the Advanced Technology Program. And while I'm pleased with the additional dollars we have been able to put into the MEP program, I am very concerned about what has been happening to ATP and am very concerned that at the moment we do not have dollars in for new awards, and would certainly welcome your thoughts about the importance of partnering around technology research issues.

And I know in Michigan, this has been extremely helpful. ATP has really made a difference in jobs and economic development. And I'm hopeful that as we move along, we're going to be able to address that, because I'm concerned that MEP is doing well, ATP is doing well in my state, but ATP at this point in time is not receiving the kind of support from Congress that it needs. And so I'm hopeful that we can correct that.

So I thank you very much, and I appreciate being a part of the hearing.

SUBCOMMITTEE ON TECHNOLOGY

HEARING ON SMALL MANUFACTURING AND THE CHALLENGES OF THE NEW
MILLENNIUM

Opening Statement of Congresswoman Debbie Stabenow
of the 8th District, State of Michigan

September 23, 1999

Chairwoman Morella, Ranking Member Barcia, thank you for your continued commitment to the issues confronting our small manufacturers. I would like to take a moment at the outset to welcome our panelists, especially Norm Braddock from the great state of Michigan. Mr. Braddock has tremendous experience in economic development and the particular needs of small manufacturers. Importantly, he also brings the experience of working for a large auto manufacturer and with the Michigan Manufacturing Extension Partnership (MEP) Center. I thank you for taking the time to be here today to share your insights with the Subcommittee.

I am most interested in learning how government can help small manufacturers adjust to the demands of the marketplace of the 21st Century. E-commerce, international trade, the need for a well-trained workforce, and promoting new technologies to ensure sustainable manufacturing will all be discussed this afternoon. Are there federal incentives that would enhance the competitiveness of our small manufacturing firms? In addition, we must not lose sight of how the other topics this Committee addresses, such as yesterday's hearing on barriers to technology in the classroom, affect the outlook for our small businesses. Without students educated in computer proficiency and other high tech skills, we will not meet our workforce needs in the future.

I would also like to state the importance of the MEP program and the need for Congress to emphasize the importance of research funding in the budget. As our witnesses will relate, the MEP program is effective, is equipped to meet the needs of small manufacturers, and is worthy of a continued federal commitment. Other federal programs, such as the Advanced Technology Program (ATP), also are essential to promote the technologies that will impact our economy in the future. Unfortunately, the ATP has not fared well before this Committee and the full House this year, and other research needs are also facing cuts. We do this to the detriment of the people we are commending today, our small manufacturers. Again, I thank the Subcommittee leadership for bringing us together today, and I look forward to our proceedings.

Chairwoman MORELLA. Thank you, Ms. Stabenow.

I'm sure she mentioned that because she saw Mr. Kammer, Director Kammer here, of the National Institute of Standards and Technology. We do have a distinguished panel.

Mr. Kammer, who's certainly no stranger to this Subcommittee, is going to share with us his efforts to assist small manufacturers.

We're also joined by Mr. Jerry Jasinowski, President of the National Association of Manufacturers, also no stranger to Congress. He'll give us an overview of the recommendations that came out of yesterday's National Manufacturing Summit. I'm also pleased to point out that Mr. Jasinowski was recently selected by the Washingtonian Magazine as one of the ten most influential association heads in Washington. I would like to congratulate him.

I forgot to bring my copy so you could autograph it, Mr. Jasinowski. [Laughter.]

In addition, we have Mr. John Churchill, Quality Assurance Director at Wilcoxon Research, a small manufacturing company located in Gaithersburg, Maryland, the great Gaithersburg, Maryland. Happens to be in my Congressional district, and I'm proud of the work they've done.

I'm eager to hear his thoughts about the challenges that face small manufacturers and how we can help companies continue to prosper.

I leave the introduction of Mr. Norm Braddock to Mr. Barcia.

Mr. BARCIA. Thank you very much, Chairwoman Morella.

I am very privileged and pleased to introduce a good friend and a very successful businessman, Mr. Norman Braddock. And I know that Representative Stabenow and I share our pride in a Michigan native appearing before our Subcommittee, especially one who has been so successful in every aspect of his life. He's an outstanding father and husband and very, very involved civically in Saginaw County and Michigan state-wide organizations, as well as his extensive experience that he brings to us today in the manufacturing sector.

Norm is a lifelong resident of Saginaw, Michigan, and spent more than 20 years working at Saginaw Steering Gear, a division of General Motors, which is now known as our Delphi plant up in Saginaw County. He held various managerial positions at Delphi, including manufacturing supervisor, workers compensation adjuster, benefit plan supervisor, labor relations supervisor, senior buyer and general supervisor of purchasing.

After a very successful career with General Motors, Norm started the Saginaw Remanufacturing Company as a joint venture to rebuild power steering pumps. His successful business soon diversified production to include inspection and sub-assembly of various other original automotive parts.

Norm, as I mentioned, is an active member of the Saginaw business community, serving as the director of numerous professional organizations, and I'll just mention just a few, but we could spend a great deal of time if we included all of the organizations he's active and involved in. Including the Saginaw African-American and Minority Business Association and the Saginaw Valley Manufacturers Association, he also currently serves, and has been a very ac-

tive member of the Saginaw County Chamber of Commerce, where he currently serves as the secretary.

And I think Norm offers us a unique perspective. He has spent 20 years, as I mentioned, working for General Motors, and is now the president of his own successful manufacturing company. He understands both the demands of major corporations, and the challenges that small and medium size manufacturers face.

I look forward to listening to his unique perspective on the Manufacturing Extension Partnership, and the needs of small businesses, and how effective that program has been in the past, and what we might be able to do in the future to ensure its continued valued assistance to our small and medium size manufacturing base in the United States.

So Norm, I'm very pleased to introduce you to our Subcommittee.

Chairwoman MORELLA. Thank you, Mr. Barcia.

It is the policy of the Science Committee and all its Subcommittees to swear in the witnesses. So if you would stand and raise your right hand.

[Witnesses stand.]

Chairwoman MORELLA. Do you swear that the testimony you are about to give is the truth, the whole truth and nothing but the truth?

[Witnesses respond in the affirmative.]

The record will indicate affirmative responses.

Our pattern is to allow each panelist to speak about five minutes. It could be a little bit over if necessary. Your written testimony in its entirety is included in the record, so you can alter it, synopsize it, whatever you want to do.

Director Kammer, let's start off with you, sir.

TESTIMONY OF RAYMOND G. KAMMER, DIRECTOR, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, TECHNOLOGY ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE, GAITHERSBURG, MARYLAND

Mr. KAMMER. Chairwoman Morella, Representative Barcia, Representative Stabenow, thank you very much for inviting me here to share some of what NIST does to improve the competitiveness of America's small manufacturers.

Manufacturing is critical to the U.S. economy. Overall, it provides nearly 20 percent of the Nation's GDP and about 17 percent of all jobs, and about 24 percent of all wages. As you know, Secretary of Commerce Daley declared this year to be the year of the small manufacturer. That was endorsed by the National Governors Association in their February meeting. And most recently, President Clinton declared this week to be Small Manufacturing Week, so this hearing's timing is very, very appropriate.

I'll defer to the other members of the panel in summarizing the first national manufacturing summit. I will say, though, from my point of view, it was extraordinarily successful. And I would also like to publicly thank Jerry Jasinowski and NAM and Judy Justinas and the Modernization Forum for their leadership in making this a successful summit.

I'm going to focus on two of NIST's programs, primarily on MEP and then share a little bit of information with you about the qual-

ity program in small manufacturing, simply because I thought that that would be of interest, and I don't think the Committee's heard all this information. Our closest NIST relationship, of course, with small manufacturers, is MEP. MEP provides hands-on information to the Nation's 385,000 small manufacturers. And over the last two decades, these small firms have generated about $\frac{3}{4}$ of all new manufacturing jobs and account for about 55 percent of the value-added money in manufacturing.

Yet many small manufacturers find it difficult to stay current with modern technology, and in comparison with larger manufacturing firms, their productivity is growing somewhat more slowly. But the MEP can help. And Phil Shapiro, who is the professor in the School of Public Policy at the Georgia Institute of Technology, recently said that systematic evaluation studies have confirmed that MEP is having a positive effect on business and the economy. And I'm going to give you the results of a few of those studies.

The U.S. Census Bureau surveyed about 4,400 firms that had been served by the NIST MEP in 1997. That represents about 5 percent of all the firms we've served since the beginning of the program. These companies reported an increase in sales of \$236 million, reduction in inventory of \$31 million, a savings of \$24 million in labor and materials. And they also reported they'd invested \$193 million in modernization and created about 6,700 new jobs.

A second study that was done by MEP that matched firms we had served in Pennsylvania with firms that we had not served that were similar in their endeavor covered about 2 percent of everybody that we've served, and that showed that on a per capita employee basis, the MEP client firms created value at a rate of about \$2,300 a year for each employee, in comparison to about \$500 a year for the firms that we had not served.

And then a final example, a study of the New York MEP found that the State's investment of about \$5 million generated an additional \$225 million or so of value-added income in New York between 1995 and 1997. And it created 2,600 new jobs.

I can't resist sharing one example with you. I met a man yesterday at the Summit who is the president of the Best Cheesecake in the World Company. They're in Chantilly, Virginia, and I sampled the product, it's quite good. The firm is about a \$2 million a year firm. They have 19 employees.

Last year, they consulted with the Virginia MEP. And based on that consultation and suggestions for improving their production processes, the firm was able to add \$91,000 in profitability. On a \$2 million base, that's actually an extraordinary, that's a 5 percent return on investment in one year's consultation.

And he's very pleased with it, and was very proud of the company and very proud of his relationship with the Virginia MEP.

Let me just say a few words about the quality program and with that, I'll close. But of the 34 companies that have won the Baldrige Award, 24 are manufacturers. Some of these are the largest companies in the world, but some of them are nearly the smallest companies in the world, for instance, Texas Nameplate, Trident Precision Manufacturing and Wainwright Industries.

Since 1995, Texas Nameplate, who won last year, has increased the number of orders shipped by 16 percent and raised its on-time

delivery record from 95 to 98 percent. Wainwright Industries, which was a 1994 small business winner, has reduced its customer reject rate by 91 percent, cycle time is better by 90 percent, and it's used the Baldrige framework to drive 10,000 quality and process improvement suggestions that they have implemented since 1994.

One of our winners in the first year is Globe Metallurgical. So that's ten years ago. And in the ten years since they won the award, they've increased revenues by about 200 percent, and they've increased profitability by 300 percent. And that's a very hard thing to do, to increase your profitability while you increase revenues.

So as I said at the beginning of my remarks, manufacturing is important to NIST. For almost 100 years, we've viewed it as our job to help the Nation's manufacturers. I'm proud of what we've accomplished, and I'm excited about beginning the next century of service to American industry.

In closing, let me thank the Committee for sponsoring us in a display that is in the Rayburn foyer that shows the products of some of the small manufacturers that we work with. I invite people to come and take a look if they get a chance.

Thank you for inviting me.

[The statement of Mr. Kammer follows:]

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Statement of
Raymond G. Kammer
Director
National Institute of Standards and
Technology
Technology Administration
U.S. Department of Commerce

Before the
House Committee on Science
Subcommittee on Technology
September 23, 1999

Chairwoman Morella and Members of the Subcommittee, I am very pleased to be here to share with you some of the work the National Institute of Standards and Technology is doing to improve the competitiveness of America's smaller manufacturers.

For nearly a century, NIST has been working with companies of all sizes and with industries of nearly every type to develop and apply technology, measurements, and standards. In fact, as you well know, Congresswoman Morella, the importance of manufacturing is singled out in the report for the 1901 legislation that established my agency and we have it engraved in stone on the wall of our main lobby. The quote reads: "... no more essential aid could be given to manufacturing, commerce, the makers of scientific apparatus, the scientific work of the government, of schools, colleges and universities, than by the establishment of the institution proposed in this bill."

Manufacturing is critical to the nation's economy. Overall it provides nearly 20 percent of the nation's GDP, 17 percent of all jobs and 24 percent of all wages.

Since smaller manufacturers -- those with 500 employees or less -- make up almost 99 percent of all U.S. manufacturers, produce more than half of our value-added goods, and employ about 12 million Americans, they are both the foundation and the future of American manufacturing. It is clear that it is in the best interest of the United States to promote a strong and healthy base of small manufacturers.

As you know, 1999 has been declared the "Year of the Small Manufacturer" by the Secretary of Commerce and endorsed in a resolution by the National Governors' Association at their February 1999 meeting. In addition, President Clinton declared this week, the week of September 19-25, 1999, as Small Manufacturing Week.

To raise awareness of the technological needs of the nation's smaller manufacturers and to gather first-hand perspective, NIST, in partnership with the National Association of Manufacturers and the Modernization Forum, brought together more than 150 smaller manufacturers from across the country in the first National Manufacturing Summit held yesterday here in D.C. I am pleased that Jerry Jasinowski, President of NAM, is here today to deliver the findings from the Summit -- and that two small manufacturers involved in the Summit are here to discuss technology related needs first hand. Also I would like to thank the Subcommittee for sponsoring an exhibit from the summit in the foyer of the Rayburn Office Building.

I would like to quickly touch on some of the areas highlighted at the Summit.

- **Electronic Commerce (eCommerce)** – eCommerce can provide small manufacturers with a tool to improve productivity; find and retain new customers, suppliers, and other business services; and expand operations into new markets. Many casual observers simply equate eCommerce with on-line sales. However, small manufacturers who take full advantage of the potential of eCommerce use it to

interact with customers, suppliers, the public, and external support functions such as payroll, utility services, and employee training.

- **Workforce** – The ability to attract, retain and effectively engage talented and productive people is a primary force influencing business strategy and business success. These “people practices” issues are as relevant for small manufacturers as they are for Fortune 100 companies. Indeed, small companies face numerous challenges in implementing effective people strategies and linking them to their business strategies.
- **International Trade** – Exports are a critical component of America’s economic health; nearly 11 percent of the nation’s GDP in 1997. The vast majority of American manufacturers who export are smaller enterprises with fewer than 500 employees. Many smaller firms do not have a strategic plan for exporting and do so on an occasional or sporadic basis.
- **Sustainable Manufacturing** – As we enter a new millennium, increasing global demand for consumer products and decreasing reserves of raw material are driving changes in manufacturing. America’s smaller manufacturers have a great opportunity to adopt new technologies that improve performance while limiting consumption.

An agency of the Commerce Department’s Technology Administration, NIST occupies a unique niche in the nation’s technology infrastructure. It is helping to build an essential foundation for technological progress and industrial growth through technical services and tools, and industrial modernization assistance, quality and performance improvement efforts, and risk-sharing incentives that motivate U.S. companies to pursue next-generation manufacturing technologies.

Many of the programs at NIST serve as resources to improve the technological advantage for the nation’s manufacturing sector while partnering with industry to ensure the project meets the customer’s needs.

Manufacturing Extension Partnership

A NIST program that provides assistance to small manufacturers is the Manufacturing Extension Partnership. MEP is where the “rubber meets the road” in providing hands-on assistance to the nation’s 385,000 smaller manufacturers. Over the last two decades, these small firms have generated about three-fourths of all new manufacturing jobs and account for 55 percent of all value added in manufacturing.

Yet, many smaller manufacturers have been slow to adopt modern production technology and business best practices. Productivity growth has trailed that of their larger counterparts, creating a gap that threatens future competitiveness. Many factors, from limited investment capital to lack of information to pressing day-to-day demands on

management, underlie this widely recognized weakness in a strategically important part of the nation's industrial base.

Until very recently, however, this problem drew only a small, fragmented response. Through the MEP network of local extension centers, each one linked to public and private organizations with complementing expertise, smaller manufacturers now have access to comprehensive sets of technology and business assistance. MEP centers have provided services to more than 77,000 smaller manufacturers. About half of these client firms employ fewer than 50 people, and nearly two-thirds employ fewer than 100. By the year 2001, MEP anticipates that affiliated centers will be delivering technical assistance to 10 percent of the nation's smaller manufacturers each year.

Created to fill the gaps in providing the technical and business services needed to improve the competitiveness of smaller firms, MEP currently has more than 400 locations serving smaller manufacturers in all 50 states, the District of Columbia and Puerto Rico. To help provide these services, MEP partners with a broad range of organizations, including state and local governments, other federal agencies, industry, non-profit groups, and educational institutions.

Even though MEP is still maturing, it quickly is becoming recognized as a vital federal-state partnership that is helping thousands of small firms improve competitiveness, increase profits, and enhance productivity.

Philip Shapira at the School of Public Policy, Georgia Institute of Technology, recently said, "Systematic evaluation studies have confirmed that the MEP is having a positive effect on businesses and the economy."

Here are the results of some of these studies:

- The U.S. Census Bureau surveyed more than 4,400 firms served by NIST MEP centers in 1997. These companies reported an increase in sales of \$236 million, a reduction of \$31 million in inventory, and a savings of \$24 million in labor and materials. They also invested more than \$193 million in modernization and created or retained 6,755 jobs.
- An analysis by the U.S. General Accounting Office found that a substantial majority of firms using manufacturing extension services improved their productivity, product quality, customer satisfaction, profits and other critical facets of their business.
- A five-year study of 1,559 MEP client companies by the Center for Economic Studies at the U.S. Census Bureau found that a conservative estimate in the growth of value-added per employee at MEP client firms is \$2,334 as compared to \$508 for non-clients.
- Many compelling accounts of MEP's contributions come from individual centers. For example:

-- The California Manufacturing Technology Center recently reported a return on investment of 294% during a three-year period. The center also reported that as a result of collaborations in 1998, 131 clients created or retained more than 1,300 jobs, increased revenues by \$56.3 million, and created tax benefits totaling almost \$34 million to local, state and federal governments.

-- A study of the New York MEP found that the state's \$5.3 million investment in the program generated an additional \$227 million of value-added income in the state between 1995 and 1997 and created 2,600 jobs.

While these data are impressive, nothing brings these numbers to life like the stories of the small manufacturers who have worked with MEP centers to improve the way they do business. Here are a few:

- ◆ Red River Hardwoods, located in Clay City, Kentucky, was having a serious problem with a clogging dust collector which frequently halted production for up to two hours a day. Terry Field, president of the 55-employee lumber mill, turned to the Kentucky Technology Service for help in correcting the problem. After implementing changes to the dust collection system recommended by KTS, Red River Hardwoods cut production downtime by more than 50 percent, increased production capacity by 25 percent and saved approximately \$15,000 a year.

Field said, "The Kentucky Technology Service ... worked closely with my firm to resolve a problem ... This type of technical service must be available to small companies at an affordable price for us to remain competitive and grow."

- ◆ Mar-Mac Wire, Inc., located in McBee, SC, manufactures quality wire products for a variety of industries. But, the cleaning process of stainless steel wire was creating a hazardous waste that was expensive to dispose. A field agent from the South Carolina Manufacturing Extension Partnership asked the Oak Ridge National Laboratory for help in evaluating the waste. The recommendation was an inexpensive filtering procedure which would remove the hazardous chromium particles and save the company \$250,000 in disposal costs.
- ◆ The Montalvo Corporation of Portland, Maine, makes tension systems for equipment in the converting and packaging industries. Because the company relies heavily not only on its manufacturing and servicing equipment, but also its business computer systems, Montalvo asked the Maine Manufacturing Extension Partnership for help in determining whether it was at risk from the year 2000 computer problem, also called Y2K or the "millennium bug." "Thanks in large part to the MEP Y2K tool, we are now as confident as we can be that the Year 2000 bug will not interfere with our operations," said Ed Montalvo, president and one of the company's managing directors.

Since its modest start in 1989 as an experimental program, MEP has evolved into a productive force for industrial modernization. It maintains its local focus, while realizing economies of scope and scale in the design and content of technical assistance programs and resources. Funded with federal, state, and local dollars, all MEP affiliated centers are non-profit organizations. All MEP centers are locally staffed and operated—organized to be responsive to the particular technical needs of an area’s manufacturing sector.

As the federal partner, NIST concentrates on making the whole greater than the sum of its parts. For example, NIST works to strengthen system capabilities in areas strategically important to smaller manufacturers. Right now, MEP is galvanizing resources and expertise to help smaller manufacturers, like the Montalvo Corporation, effectively tackle the “millennium bug.” Through its Y2K Self-Help Tool, which is available in English, Spanish, and several other languages; a help center and a web site; as well as informational and educational materials, MEP is helping thousands of small businesses address this potential problem. Through an alliance with the U.S. Department of Agriculture, the U.S. Small Business Administration, and others, MEP is helping not only small manufacturers, but any small business avoid Y2K problems. MEP’s reach and impact have been impressive, demonstrating what a federal-state-local-private sector partnership can accomplish.

Other network-wide MEP assistance includes:

Sustainable manufacturing. With affiliates across the country, the U.S. Environmental Protection Agency, and other partners, MEP is developing and testing tools that will help small manufacturers reduce waste, emissions, and inefficiencies as well as the burdens of complying with environmental regulations. In center-conducted assessments, difficulties encountered when responding to environmental regulations and permitting requirements often rank among the top challenges cited by manufacturers.

Technology and the workforce. In MEP’s assessment of challenges facing smaller manufacturers, workforce training is second only to the constant requirement to reduce costs while increasing quality. Human resources projects now account for 10 percent of all MEP technical assistance activities. MEP staff and affiliates are working with the U.S. Department of Labor, community colleges, and other organizations to further build system-wide capabilities to help firms upgrade worker skills and devise high-performance workplace strategies most appropriate for their businesses and workforces.

Anticipating needs and challenges, MEP also is designing new initiatives to help smaller manufacturers acquire the capabilities necessary to compete successfully in the 21st century. Current trends indicate that the supply-chain optimization efforts of major original equipment manufacturers will be especially critical to the long-term performance and business health of smaller manufacturers.

MEP is working with smaller manufacturers to help them gain the organizational, logistical, and operational skills required to perform effectively and profitably in the emerging era of supply-chain-centered competition.

Measurement and Standards Laboratories

In every industry, firms of all sizes and types rely on a portfolio of supporting, generic technologies that are integral to a company's manufacturing capabilities. These indispensable tools range from tables of scientific and engineering data to statistical quality-control methods to measurement techniques for ensuring that one coordinated measuring machine's micrometer is calibrated with another machine's micrometer.

NIST is a key supplier of such infrastructural technologies and services. The results of NIST research lead to industry-accepted test and measurement methods, process models, interface standards, and other useful tools. In industries ranging from electronics to radiopharmaceuticals and from chemical processing to aerospace, these tools contribute to effective operations and quality products. The capabilities that they support often set the technical limits on what can be accomplished on the factory floor, in the research and development laboratory, or with suppliers and customers.

For example, we distribute about 350 NIST-developed Standard Reference Materials, the equivalents of certified "rulers" that firms use to check the accuracy of their own measurements. In manufacturing SRM's support motor-vehicle production at nearly every step of the process, from the manufacture of sheet metal, windshields, tires, and transmission gears to final assembly.

In the optical-fiber industry, technical contributions made by NIST's Measurement and Standards Laboratories serve as the basis for more than two dozen standardized measurement methods that U.S. producers credit with helping them to maintain their world-leading market share.

NIST's technical assistance helps manufacturers build capabilities that underpin their competitive performance. Consider our work with American Superconductor Corporation, a small but rapidly growing company in Westborough, Massachusetts. Up against the likes of Germany's Siemens and Japan's Sumitomo, this 220-employee firm is positioning itself to be a major player in the emerging global market for wires, energy-saving motors, and other products made with high-temperature superconductors.

Discovered in the late 1980s, this class of ceramic materials conducts electricity without resistance—even at relatively high temperatures. But the materials are hard to work with, which has confounded commercial development efforts. They're extremely brittle and minute flaws can disrupt current flow. Exacting materials-characterization techniques and quality-control measurements are a must.

American Superconductor turned to the NIST laboratories to help it make highly accurate measurements of the crystalline texture of the superconducting ceramic. The company wanted to make these advanced measurements with a relatively ordinary piece of equipment that it already owned. Our researchers met the challenge. They developed measurement techniques and special analysis software that quickly made optimal use of data obtained with a conventional X-ray diffractometer.

Measurement needs are growing and diversifying in every area of manufacturing. In precision manufacturing, a label that applies to a growing portion of the discrete parts industry, dimensional tolerances are shrinking to ever-smaller fractions of a split hair. Meanwhile, the shapes of parts and products are growing more complex. In the continuous-process industries, manufacturers must continuously raise the threshold for levels of selectivity and specificity. In fact, all manufacturing industries are being driven to improve processes, reduce waste, and raise quality. At the same time, emerging technologies present tantalizing prospects for novel products and processes, but they also introduce new measurement challenges that must be overcome before these opportunities can be fully realized.

Today, we are putting greater emphasis on the infrastructure needed to support advanced computing and communications technologies and, just as important, the capabilities that they enable. This includes what some are calling *E*-Manufacturing.

One thrust of this wide-ranging work is developing prototype standards, tests, and other tools for interoperability. Tools that enable the almost myriad elements of information technology, the hardware and the software, to work together efficiently. This is a critical need.

Consider, for example, that lack of interoperability costs the U.S. automotive industry alone about one billion dollars a year—and that's a conservative estimate. Part of the solution to this costly problem is an international standard called STEP, which stands for the Standard for the Exchange of Product Model Data.

NIST has worked for over a decade with hundreds of firms and thousands of people from around the world to develop STEP. It's a new kind of standard, designed to evolve and grow with the needs of industrial users of information technology. STEP enables direct computer-to-computer exchanges of a growing variety of product data—all the way from design to after-sale support, even recycling.

Elements of STEP have been adopted by makers of design software, and the manufacturers who use the standard are realizing significant benefits, from major improvements in the reliability of data exchanges to substantial savings in the purchase and implementation of computer-aided manufacturing systems. Small manufacturers are a vital part of this equation.

At NIST's National Advanced Manufacturing Testbed, teams of researchers have worked to solve measurement and standards issues that impede companies and industries from making the most of their information technology, individually and collectively.

The NAMT is a distributed, multiproject testbed built on a state-of-the-art, high-speed computing and communications infrastructure—the research counterpart to the distributed and virtual enterprises envisioned for 21st-century manufacturing. It links people—as well as specialized facilities and resources—at sites around the country as they tackle process-specific challenges and opportunities. Though focused on specific problems and needs, all NAMT projects have been aimed at modular solutions that are integratable elements of larger systems. Now, NIST is moving ahead with planning the next incarnation of this testbed to best meet the information technology-driven needs of U.S. manufacturers, including small manufacturers.

In consultation with industry, NIST is stepping up efforts in key technology areas likely to have a major impact on future manufacturing capabilities. On behalf of U.S. industry, it also is intensifying and broadening its technical activities in the international standards arena, which greatly influences the ability of the nation's manufacturers to sell their products in foreign markets. These are concerns for U.S. manufacturers, regardless of size, as we move into the next century.

Advanced Technology Program

The rapid pace of innovation and change in the global economy has affected every aspect of business, nowhere more so than manufacturing. What was good enough yesterday is not good enough today. The NIST Advanced Technology Program helps deliver the innovations that U.S. manufacturers need to stay competitive.

Since its start in 1990 as a small experimental program to promote “commercializing new scientific discoveries rapidly” and “refining manufacturing practices,” the ATP has promoted innovation in industry processes and technology, including important advances in manufacturing.

The ATP helps bridge the gap between the laboratory and the marketplace and stimulate partnerships among companies of all sizes, universities and the whole R&D enterprise.

- An early ATP award to the Auto Body Consortium sparked a landmark R&D project that brought together the initiative and talents of eight small and mid-sized suppliers to the auto industry and two universities, with matching funds from General Motors Corp. and Chrysler Corp. The consortium developed a suite of innovative processes and tools that improve the quality of vehicle body assembly. The results are being implemented in auto plants around the country and independent analysis done by CONSAD Research Corporation estimates savings to consumers and car makers of up to \$650 million annually on maintenance which will stimulate a multi-billion-dollar increase to the U.S. economy.

- Another ATP project coordinated by the National Center for Manufacturing Sciences brought together nine companies ranging in size from very small to large to develop new drive and control technologies for machine tools – the machines that build other machines. Lest this sound rather ordinary, I might point out that no fewer than three individual developments from this project have received “R&D 100” awards for significant technological innovation. Just *one* innovation from this project can save the auto industry more than \$6 million annually in producing a single part. Multiply that by many parts and many industries.
- Other ATP awards have allowed a small innovative company called Autospect to develop a unique – and badly needed – technology for measuring the thickness of wet paint on metal; enabled the Ingersoll Milling Machine Company to develop a new class of light-weight, high-precision machine tools; and made it possible for small Saginaw Machine Systems, Inc., to develop a high-performance control system for machine tools that dramatically improves machining accuracy.

At a time when companies are concentrating more of their research and development efforts on the predictable, the incremental, the nearly immediate; at a time when – as the Council on Competitiveness recently reported – “less and less” private-sector R&D “is spent on longer range research, the kind of research that ensure continued economic growth,” the ATP encourages companies large and small to focus on the long term, to look beyond the next one or two product cycles and to invest the resources required to convert promising, but unproven, emerging technologies into new products and manufacturing methods.

ATP projects in manufacturing run the gamut from sheet-metal industries to electronics, and from the literal cutting edge – high-performance tooling – to sophisticated software to streamline and manage manufacturing enterprises.

Since 1990, the ATP has selected at least 58 R&D projects that could directly impact the future of manufacturing in the U.S. That translates to about \$170 million in industry cost-sharing and investment in advanced manufacturing research matched by an ATP investment of about \$164 million. Those projects involve more than 200 companies, universities, non-profit research organizations and federal laboratories. More than 70 of the participants are small businesses.

With industry, ATP regularly surveys the technology horizon for long-term opportunities that, down the road, may pay significant dividends in terms of U.S. competitiveness and economic growth.

Baldrige National Quality Program

NIST’s Baldrige National Quality Program focuses on quality and performance excellence of American organizations, including manufacturers.

Since its creation in 1987, the Baldrige National Quality Program has played an important role in helping the United States regain its competitive edge and its world-class quality ranking among nations. But, the competitive race is far from being won. For manufacturers, in particular, quality now is a mandate, not an option. Companies worldwide recognize the competitive advantages achieved through quality and performance excellence. To attain and retain market leadership in the next century, U.S. companies will have to improve continuously.

Of the 34 companies that have won the Baldrige Award, 24 are manufacturers. These include some of the nation's largest firms, such as Motorola and Eastman Chemical Co., and smaller manufacturing businesses, such as Texas Nameplate Co., Trident Precision Manufacturing and Wainwright Industries. For all, the Baldrige Award process has proven to be an effective tool for continuous improvement.

Following the Baldrige guidelines continues to pay performance improvement dividends to firms that maintain their commitment to quality. Consider a few examples:

Since 1995, Texas Nameplate Company (1998 small business winner) has increased the number of orders shipped by 16 percent and raised its on-time delivery record from 95 to 98 percent.

Wainwright Industries, Inc. (1994 small business winner) has reduced its customer reject rate by 91 percent and cycle time by more than 90 percent. It used the Baldrige framework to drive more than 10,000 quality and process improvement suggestions implemented each year since 1994.

Nearly 25 percent of Eastman Chemical Co.'s (1993 manufacturing winner) sales come from new or improved products developed in the last five years.

Since winning the Baldrige Award in 1988, Globe Metallurgical, Inc. (1988 small business winner) has experienced a 204 percent increase in revenues and a 310 percent increase in profits.

Thousands of organizations use the Baldrige Award criteria to assess their own operations. Almost two million Baldrige Award criteria have been distributed and thousands more downloaded from the NIST web site. Annually updated and enhanced by leading quality and business experts, the criteria serve as very functional tools—as scorecards to size up performance and identify opportunities for improvement.

Further fueling the drive for quality improvement, the Baldrige Award has become a widely emulated model—the standard for performance excellence. Not only do more than 40 states have award programs, but also, more than 25 international quality awards have been established. Most resemble the Baldrige Award, including one launched by Japan in 1996.

NIST is mapping out ways to strengthen awareness of the award program and criteria among smaller manufacturing businesses and other similarly sized firms. As Texas Nameplate, Trident and Wainwright demonstrate, such companies can benefit greatly by implementing the Baldrige framework.

Conclusion

As I said at the beginning of my remarks, manufacturing is important to us at NIST. It is not only engraved on our wall, it is part of our heritage. For almost 100 years it has been our job to help the nation's manufacturers, both large and small, create and capitalize on technological opportunities. I am very proud of what we have accomplished and am excited about beginning our next century of service to American industry.

Thank you. I will be pleased to answer any questions.

NIST Office of the Director



Mr. Raymond Kammer, Director

Raymond Kammer was nominated by President Clinton on September 4, 1997, to serve as Director of the National Institute of Standards and Technology. After being confirmed by the U.S. Senate, he took office on November 12. An agency of the U.S. Commerce Department's Technology Administration, NIST promotes U.S. economic growth by working with industry to develop and apply technology, measurements, and standards. As NIST Director, Mr. Kammer oversees a staff of approximately 3,300 and a budget of about \$700 million. More than half of the staff is composed of scientists and engineers located at the NIST campuses in Gaithersburg, Maryland, and Boulder, Colorado.

Most recently, Mr. Kammer served on an acting basis as the Chief Financial Officer, the Assistant Secretary for Administration and the Chief Information Officer for the Department of Commerce. As Deputy Director of NIST from 1980 to 1991 and 1993 to 1997, Mr. Kammer was responsible for the day-to-day operation of the Institute and for long-range planning and policy development. The primary mission of NIST is to strengthen the U.S. economy and improve the quality of life by working with industry to develop and apply technology, measurements, and standards. It carries out this mission through a portfolio of four major programs:

- Measurement and Standards Laboratories that provide technical leadership for vital components of the nation's technology infrastructure needed by U.S. industry to continually improve its products and services;
 - the Advanced Technology Program, accelerating the development of innovative technologies for broad national benefit through R&D partnerships with the private sector;
 - a grassroots Manufacturing Extension Partnership with a network of local centers offering technical and business assistance to smaller manufacturers; and
- a highly visible quality outreach program associated with the Malcolm Baldrige National Quality Award that recognizes business performance excellence and quality achievement by U.S. manufacturers, service companies, educational organizations, and health care providers.

From 1991 to 1993, Mr. Kammer was Deputy Under Secretary of Commerce for Oceans and Atmosphere in NOAA. In that position, he served as NOAA's Chief Operating Officer and was responsible for overseeing the technical projects of this \$2 billion agency which has a staff of over 14,000. NOAA has five major programs - the National Weather Service; the National Marine Fisheries Service; the National Environmental Satellite, Data, and Information Service; the National Ocean Service; and the Office of Oceanic and Atmospheric Research.

Mr. Kammer began his career with the Department of Commerce in 1969 as a program analyst. Prior to his appointment as Deputy Director of NIST, Mr. Kammer held a number of positions at NIST and in the Department of Commerce involving budgetary and program analysis, planning and personnel management. During his tenure as Deputy Director, he also held positions as Acting Director of NIST, Acting Director of the National Measurement Laboratory at NIST, and Acting Director of the Advanced Technology Program at NIST.

Mr. Kammer has chaired several important evaluation committees for the Department of Commerce, including reviews of satellite systems for weather monitoring and the U.S. LANDSAT program, and of the next generation of weather radar used by the U.S. government. He also served on the Board of Directors of the American Society for Testing and Materials, a major international society for the development of voluntary standards for materials, products, systems, and services.

His awards include both the Gold and Silver Medals of the Department of Commerce, the William A. Jump Award for Exceptional Achievement in Public Administration, the Federal Government Meritorious Executive Award, and the Roger W. Jones Award for Executive Leadership.

Kammer received his Bachelor of Arts degree from the University of Maryland in 1969.

Chairwoman MORELLA. Thank you, Director Kammer. I hope they will drop by and look them over. We'll publicize that.

Mr. Jasinowski, delighted to have you here and hear from you, sir.

TESTIMONY OF JERRY JASINOWSKI, PRESIDENT, NATIONAL ASSOCIATION OF MANUFACTURERS, WASHINGTON, D.C.

Mr. JASINOWSKI. Thank you very much, Madam Chairman. And thank you for your leadership and good humor and general grace in this region in a Congress that has been enhanced by your spirit and personality and leadership a great deal. And thank you, Congressman Barcia, for sponsoring this hearing as well.

I would be remiss if at the very beginning in summarizing the Summit that we've just had not to indicate that there is a strong element of partnership that came out of this between NIST, the Extension program and the small manufacturers and business in general. I think that it's easy to underestimate the extent to which there are great opportunities for government and the private sector to cooperate on a whole host of things, whether or not it be the DARPA program or the investments we make in health or the magnificent leadership we've had on the quality program, and now this continued strength in the Extension program which is very valuable to small manufacturers.

And many of the small manufacturers that I was with yesterday are members, we have 10,000 small manufacturers, said to me that they've found it very valuable to be able to develop those partnerships. And that cuts across the issues of trade, technology and training that we're examining at the Summit. So that was a cross-cutting theme that came through, and I think is important for this Committee to have someone from the private sector emphasize.

And I think the second, and to thank both the NIST and the Extension program leadership that we had on the Summit, and that we have generally from those two fine institutions. I think the second point I'd make, Madam Chairman, is that manufacturing has made an extraordinary comeback in this country and we now see productivity in manufacturing that is running at 4 percent, which is twice the rate of what it is in the country as a whole. We have about 60 percent, $\frac{2}{3}$ of the technology in this economy is either done by or created by manufacturing. It is much more high-tech than anyone has any sense of at all.

And that is as true of small manufacturing as it is of large manufacturing. If there is anything that is striking, it is the extent to which these people we were with yesterday are much more technologically sophisticated than you would imagine. For example, in a survey we did for this event, 80 percent of the small manufacturers we surveyed, 80 percent, have a web site. Whereas if you look at the figures for American business as a whole, it is only 20 percent.

And I think that's because manufacturing, by the nature of its process, is a rather sophisticated operation that requires computers and all the software and information processing that's a part of this. And we have been doing this now for a long time in order to increase our productivity and be competitive. And so it's a productivity, technology community, and that goes for the small manufac-

turers who contribute about 60 percent of the value of manufacturing as a whole, and about 65 percent of manufacturing jobs.

So this is a high-tech group. Most of the people who are making extraordinary success in e-commerce and e-business are small companies, I might add, many of which are software and other kinds of manufacturing companies.

I think, well, we learned important things in the trade and environmental area that I've outlined in my testimony. And I would say just a sentence on each, because I want to go on to the other two areas, which I think it's more important to stress. In the area of the environment, what was stressed is the need for greater flexibility, greater cooperation with respect to the private sector, and the public sector, and improved emphasis in the private sector on seeing environment as a quality enhanced program.

It was striking how much more friendly small manufacturing feels about its state environmental representatives than it does the EPA. And I know that Administrator Browner will be interested in that, and she's making an effort to try to respond more to small manufacturers.

But there's an important lesson there, and it indicates that if you have cooperation, if you have early warning and all of that, these regulatory initiatives at the environmental level can work much better.

In the trade area, the single message that came through that was most important is that nobody fully understands, including small manufacturers, all the benefits associated with global trade, that you have in fact a lot more people who are gaining from that than is possibly recognized. I think the two areas that are of far greater importance which I have emphasized are e-commerce and the training area.

And in the e-commerce area, we simply need to provide much better information to the small manufacturers, a better tool kit for them to get involved in, greater bandwidth access and an opportunity to have the infrastructure that they need. In terms of their payoff, focusing on the supply chain, as has been suggested earlier by the Committee, is the area that will pay off the most.

On work force issues, it was generally agreed this is the number one issue facing all small manufacturers in terms of education and training. Eighty-three percent of all small manufacturers say they still have a hard time finding the employees they need. And there what we need is again partnerships with the community colleges, with the work force investment extension, with the extension programs in order to solve this program together.

Beyond that, small manufacturers need to look at the training thing as part of a larger profit sharing and empowerment effort. If you look at the best companies, they succeed because they give the workers a stake in the enterprise, in terms of how it's run, how they share in the profits, and in terms of incentives, for them to be fully trained.

So I think, Madam Chairman, those are the main conclusions from the conference as I saw them, from the perspective of the National Association of Manufacturers.

[The statement of Mr. Jasinowski follows:]

**Testimony of Jerry Jasinowski
President, National Association of Manufacturers
Before the
House Science Subcommittee on Technology
September 23, 1999
on
Small Manufacturing and the Challenges of the New Millennium**

Madam Chairwoman, it's a privilege for me to be here with this distinguished panel to present the findings of the just-completed 1999 Manufacturing Summit. The Summit was held down the street at the Reagan Building and was attended by several hundred small business leaders from across the country.

My organization, the National Association of Manufacturers, represents 14,000 companies and 350 member associations in all 50 states. We represent 18 million people who make things in America. And of our 14,000 corporate members, 10,000 are small and mid-sized manufacturers.

Small manufacturers play a decisive role in the success of the American economy. Small manufacturing contributes 55 percent of the value of all manufactured goods and 65 percent of manufacturing employment. That's 12 million jobs and about one in ten of all American workers.

These statistics underscore the importance of small manufacturing to the future of our economy. While our current economic boom is welcome news to all

of us, it can only continue if we carefully foster policies that encourage further growth and facilitate that growth in every economic sector.

At this week's summit, we addressed four areas of critical concern to today's small manufacturers. Let me give you an overview of them and then turn to my colleagues on this panel for more extensive comment on them.

First, however, let me also mention two issues that rank as among the highest priorities for small companies across our country. The estate, or "death," tax, affects nearly 50,000 households every year. It can send small businesses into bankruptcy or at least severely weaken them. It's a tax on family businesses that parents have often spent their whole life building. And it affects small manufacturers disproportionately.

There's a simple solution to the death tax: Kill it. By getting rid of it, family businesses can better stay intact. And successful businesses mean higher growth in our economy. That's not theoretical economics – that's common sense.

Labor costs are also extremely high. Benefits account for between 25 to 30 percent of employees' compensation. Compound that with a seven percent payroll tax for Social Security, and it's no wonder labor costs are rising.

The solution is clear: We've got to get a handle on entitlements. Medicare and Social Security need private sector-oriented reform not just to preserve and enhance the existing systems but to enable employers to pay their workers the compensation they deserve.

Now let me go onto the four major areas covered at the Summit. I'll begin with the most critical. Every company in the country is affected by the ongoing crisis in finding qualified employees. Survey after survey shows that firms of all sizes have difficulty locating men and women who can perform not only sophisticated high-tech tasks but even read and write sufficiently to function in the workplace. In our own survey of our 10,000 small and mid-sized members, 83 percent of those responding said they have difficulty recruiting and retaining qualified employees.

At the summit, we discussed that two of the particular problems facing small manufacturers relate to demographic changes and workplace regulations. Many smaller companies want to hire more minorities, more seniors and more older Americans but they lack the resources to train them effectively. Consequently, employee training and education take on a special urgency for smaller companies.

In the survey I mentioned a moment ago, we found that of the companies that offer training to their workers, about four out of five trained on-site while 22 percent used a local school or community college to train their employees.

In addition, many small firms are frustrated by government regulatory burdens. Compliance with regulations takes time, money and energy. While some mandates are necessary, the surfeit of rules bleeds away the ability of many smaller manufacturers to train current and potential employees.

One cost-effective solution relates to the second issue we addressed at the summit, the Internet. On-line training resources can help smaller firms teach employees the skills they need. But more broadly, E-commerce can help small

companies develop new products and markets, interact more quickly and efficiently with suppliers and customers and improve productivity while reducing cycle time, transaction costs and paperwork.

Of the respondents to our survey, 80 percent said they have Web sites, compared to only 18 percent nationwide. Three out of five are using the Net to communicate with their domestic customers.

However, there are definite challenges to small companies when it comes to the electronic economy. Initiating an e-commerce site can be quite expensive, and electronic technology changes so rapidly some firms are afraid of investing in E-commerce for fear that they will rapidly be locked into electronic obsolescence. And as I mentioned earlier, developing and maintaining an aggressive E-commerce portfolio demands skilled employees and Internet-friendly vendors. Given the smaller margin for financial error inherent in smaller enterprises, these concerns are very real.

E-commerce is, of course, not limited to America's borders, which is where the third area considered by the summit comes in. International trade offers many opportunities to America's smaller firms as we open new markets overseas.

Federal export financing is critical to many smaller manufacturers. The regime of federal export support enables many companies to market their goods abroad. In our survey, nearly 28 percent of companies responding derived between one-quarter to one-half of their sales from direct or indirect foreign trade. But as was noted at the summit, less than 13 percent of small manufacturers export abroad. They are held back by the time and expense of developing business plans,

finding out where and how they can sell their goods, the complex process of navigating through the web of international trade restrictions and tariffs, and finding the kind of support they need from domestic distributors, wholesalers and other potential partners.

None of these barriers are insurmountable. But to many small manufacturing firms, they are, at the least, quite daunting, which underscores the need for lower trade barriers and such federal programs as the Ex-Im Bank.

No less daunting to many smaller manufacturing companies is the need to engage in what is now being called “sustainable manufacturing.” Let me be clear that I am always wary of terms-of-art because they can mean so many different things and can be used to subtly advance agendas with which the manufacturing community is uncomfortable.

Small manufacturers have a proud record of environmental excellence. In 1994, manufacturers with 20 or more employees spent nearly \$29 billion for pollution abatement activities. Small manufacturing employers and employees drink the water and breathe the air like all citizens. Ninety-two percent of the respondents to our survey noted that in the last five years they had reduced waste in the manufacturing processes at their factories.

This record serves as a backdrop for any discussion of “sustainable manufacturing.” Many of us may not agree on what is meant by “sustainability,” or even whether this term is the right concept with which to begin a discussion. However, there appears to be a growing consensus that “efficiency” is a central component of a successful future.

The world marketplace is growing increasingly competitive, putting serious pressures on the engines of our prosperity, namely manufacturing employees, the companies where they work and the communities in which they live. As mergers and consolidations continue at a rapid pace, the pressure small manufacturers, their workers and their communities intensifies.

To stay competitive, efficiency is mandatory. The quest for efficiency is the great ally of environmental progress. Greater efficiencies, brought about by innovation and a regulatory and credit climate that encourage implementation of productivity-enhancing innovations, can reduce resource use, waste streams and energy consumption.

Efficiency is demanded not only in manufacturing processes, but also in how government regulates. It's worth noting that small manufacturers are extremely leery of the federal Environmental Protection Agency and its regulatory regime: 63 percent of the survey's respondents say they trust their state environmental agency to best enforce environmental regulations appropriately as opposed to only seven percent for the EPA.

Regulators must prioritize additional pollution reductions through the best peer-reviewed science available, and with consideration of possible adverse consequences. Governments can encourage efficiency in manufacturing by prioritizing risks and establishing a business environment that encourages performance standards, provides flexible and reasonable compliance regimes and reduces regulatory uncertainty and delays.

All four of these issues – E-Commerce, trade, employee training and sustainability – are woven together by the need small manufacturers have to enhance productivity and achieve higher growth. This was the context of our very successful Summit, which I've been pleased to tell you about.

Thank you, Madam Chairwoman, for inviting me appear before your panel. I look forward to interacting with you following the conclusion of my colleagues' testimony.

- NAM -



**JERRY J. JASINOWSKI
PRESIDENT AND CEO
NATIONAL ASSOCIATION OF MANUFACTURERS**

Jerry Jasinowski is president and CEO of the National Association of Manufacturers, the largest national industry trade group in the country, and one of the nation's most frequently quoted authorities on political, economic and manufacturing trends and new developments.

Jasinowski has addressed audiences across the country -- from The Commonwealth Club of California to the National Press Club in Washington, D.C. -- as:

- an astute analyst who understands the rapid changes creating a new global economy and their impact on business and workers;
- a CEO who runs a first-class operation and has written a book on how manufacturing companies have regained their competitive edge, *Making It In America: Proven Paths to Success from 50 Top Companies* (Simon & Schuster, March 1995);
- a player in the political game whom *Washingtonian* magazine calls industry's "most powerful advocate on Capitol Hill"; and
- editor of *The Rising Tide* (John Wiley & Sons, Inc., Feb. 1998), which brings together 27 prominent thinkers on how to increase company and economic growth.

Under Jasinowski's leadership, the NAM has been hailed as Washington's most influential and respected business group, helping to shape national policy on a broad range of issues from taxes to trade. He currently is calling for a national strategy to boost economic growth and improve opportunities for employees through empowerment, education and wealth creation. He also has written and lectured on what companies should do to increase their growth, particularly in terms of factory floor productivity, going global and empowering and educating workers.

Jasinowski is widely quoted in the media and has appeared on almost every major national network and public affairs program, including ABC's *Good Morning America*, *Nightline* and *This Week with David Brinkley*, NBC's *Today*, *Meet the Press* and *The McLaughlin Group*, CBS' *Face the Nation*, CNN's *Crossfire* and *Moneyline*, PBS' *Firing Line*, C-Span and the evening network news shows. His opinion editorials have run in *The New York Times*, *Washington Post*, *Chicago Tribune*, *Harvard Business Review* and other major publications.

Jasinowski became president of the NAM in January 1990, after serving as the association's executive vice president and chief economist for ten years. The NAM is the largest and oldest broad-based industrial trade association in the United States. Its more than 14,000 member companies and affiliates, including approximately 10,000 small firms, employ

-more-

JASINOWSKI/Page Two

18 million people, are in every state and account for roughly 85 percent of U.S. manufactured goods.

A one-time factory worker, Jasinowski joined the U.S. Air Force as an intelligence officer serving in the Far East in the mid-1960s. He went on to become assistant professor of economics at the U.S. Air Force Academy. In the early 1970s, Jasinowski came to Washington to manage research and legislative activities for the Joint Economic Committee of Congress. In 1976, he served as director of the Carter Administration's economic transition team for the departments of Treasury, Commerce, Labor, the Council of Economic Advisors and the Federal Reserve. He later was appointed assistant secretary for policy at the U.S. Department of Commerce.

A native of LaPorte, Indiana, Jasinowski received his B.A. in economics from Indiana University, his master's degree in economics from Columbia University, and is a graduate of the Harvard Business School's Advanced Management Program. He serves on the board of directors for Phoenix Home Life and Atwood Richards. In 1997, Jasinowski was awarded the Anti-Defamation League's Person of the Year Award for his leadership role in advancing more inclusive policies for the workforce, including immigration.

Jasinowski has three children and resides in Washington, D.C. with his wife, vice president of government relations for The Goodyear Tire & Rubber Company.

-NAM-



Jerry J. Jasinowski
President

September 23, 1999

The Honorable Constance A. Morella
Chairwoman
Subcommittee on Technology
U.S. House of Representatives
2320 Rayburn House Office Building
Washington, DC 20515

Dear Rep. Morella:

This is to confirm that, the NAM is not a contractor with the federal government nor a recipient of federal government grants.

Sincerely,

A handwritten signature in black ink that reads "Jerry J. Jasinowski". The signature is written in a cursive, flowing style.

Manufacturing Makes America Strong

1331 Pennsylvania Avenue, NW, Washington, DC 20004-1790 • (202) 637-3106 • Fax (202) 637-3182 • www.nam.org

Chairwoman MORELLA. Nice, succinct testimony. Thank you, Mr. Jasinowski. We'll have a chance to ask further questions, ask some questions on it.

Mr. Churchill, delighted to have you here, sir.

TESTIMONY OF JOHN CHURCHILL, QUALITY ASSURANCE DIRECTOR, WILCOXON RESEARCH, GAITHERSBURG, MARYLAND

Mr. CHURCHILL. Good afternoon, Chairwoman Morella and Representative Barcia and Members of the House Technology Subcommittee.

As a representative of a small business located in Gaithersburg, Maryland, in Chairwoman Morella's district, I'm honored to appear before the House Technology Subcommittee. I'd like to thank Chairwoman Morella, first for inviting me to testify and to share some of the experiences we've had with the programs, and also for, to let you know we appreciate the work that you've done to help make an environment favorable to small businesses in our district, as we compete in the international marketplace.

I'm Director of Quality Assurance at Wilcoxon Research, Incorporated. It's a small company that designs and manufactures vibration sensors and associated equipment, it's sort of a very specialized part of the market. A little bit about the company, just to give you some background, Wilcoxon Research was formed in 1960. It remained a very small company until around the 1980s, at which point we started to grow quite rapidly.

We employ currently around 110 people and sell about \$9 million worth of product to laboratories, to the U.S. Government, to other equipment manufacturers, original equipment manufacturers, and also to end users. The sensors that we manufacture are primarily installed to monitor bearings on rotating shaft type of equipment, such as helicopter rotors, power generation equipment, cooling fans and paper mills. These instruments allow customers to reduce their costs and become more competitive through predictive maintenance, lets them monitor their equipment and optimize it, and prevent unexpected shutdowns, that sort of thing.

We've used the Technology Extension Service now, which is a manufacturing extension partnership program administered through the University of Maryland, on several occasions. I'd like to briefly talk about two of the occasions. In my written testimony I have several more, and more details there.

The program, though, first it has provided us access to technical information, experts in specialized equipment, to help us solve problems that, in a timely manner, that would be very difficult for us to solve otherwise on our own, with limited resources that a small business has. In 1992 and 1993 time period, we were experiencing a number of failures out in the field in a certain application of the product that we supply. They were associated with paper mill applications that had a very high temperature and high humidity and caustic chemicals presence. Something there was causing our sensors to fail.

We got in touch with the Technology Extension Service after attempting to solve the problems with the sensors on our own. They gave us access to a scanning electron microscope, also provided us

access to conformal coding experts and gave us information on processes and materials associated with that. They were able to help us review our vacuum and nitrogen purge systems, which were part of the processing that we used, help us to interpret some residual gas analysis testing that we had had performed at a commercial service, but we had difficulty interpreting the results of that.

And they also finally gave us access to a highly accelerated stress test chamber, which allowed us to prove out some of the potential solutions before we actually worked them into our product. So with their help there, and that was help that we would find very difficult and costly to find on our own. We were able to correct several sources of the problems that we had and remain competitive in that market. Basically at that time, that market represented about 50 percent of our sales, so it was an extremely important market to us. And having quick, immediate access to that information was very valuable.

Another occasion, they helped us improve the yield and reliability of some of our smaller electronic circuits. Many of the markets that we serve desire small, lightweight units as is the general trend in all technical instrumentation. One method of achieving that is through wire bonding technology. That's a method of assembling electronic circuit in a much smaller package.

We had purchased some wire bonding equipment and had attempted and fairly successfully got it up and running and written the processes involved with it. But yet, we were still experiencing a fairly high failure rate internally. And we had some, we weren't quite sure of the reliability of the product that we had going out the door.

The Technology Extension Service was able to provide us with a wire bonding expert from the Naval Research Laboratory who helped us optimize our processes, including in the areas of test handling and storage burn-in, cleaning and coding. And they greatly assisted us in getting that process up and running now.

And as I mentioned, we had several other examples of the way we've made use of these services. And I'd be happy to answer any questions that you have. Thank you.

[The statement of Mr. Churchill follows:]

Testimony of
John Churchill
Quality Assurance Director
Wilcoxon Research, Inc.
Gaithersburg Maryland

For the Hearing Concerning Small Manufacturing and the Challenges of the New Millennium
Before the House Technology Subcommittee of the House Science Committee

Thursday, September 23, 1999

Good Afternoon Chairwoman Morella and members of the subcommittee. As a representative of a small high-tech manufacturer located in Gaithersburg Maryland, in Chairwoman Morella's district, I am honored to appear before the House Technology Subcommittee.

My name is John Churchill, I serve as the Director of Quality Assurance at Wilcoxon Research, Inc., a small company that designs and manufactures vibration sensors and associated accessories. Formed in 1960, Wilcoxon currently employs about 110 people and sells \$9 million worth of product to laboratories, the US government, and original equipment manufacturers. Our instruments are primarily used in monitoring and measuring vibration in order to control equipment vibration and predict component failure. The sensors are typically installed to monitor bearings on rotating shaft type equipment such as helicopter rotors, power generation equipment, cooling fans, and paper mill rollers. These instruments allow our customers to reduce their costs and become more competitive through predictive maintenance practices.

We have made use of the services of the Technology Extension Service, a Manufacturing Extension Partnership program, administered through the University of Maryland on at least six occasions. The Technology Extension Service provided valuable resources in our efforts to increase our products' reliability in specific harsh environments, solve equipment failure problems in a timely manner, reduce scrap and rework, and to stay competitive in the international market.

The Technology Extension Service provides us a source of up to date technical information, experts, and access to specialized equipment which would be very difficult and/or cost prohibitive to obtain elsewhere. The speed and quality of their help is of the utmost value when a manufacturer such as ourselves is faced with a problem, which may have serious adverse affect on our business. We especially appreciate their help in our somewhat specialized manufacturing niche for which finding sources of expertise can be very difficult.

Occasion 1 - Product failure in high temperature applications

In 1992 and 1993 we saw an increase in the number of reported failures and product warranty returns associated with paper mills, one of our primary market applications. Failure to solve this problem in a timely manner would of likely excluded us from further participation in the market. The market represented approximately 50% of our sales. Continued failure of our product in this market would also adversely affect our reputation in other markets.

The environment of this application was continuous temperature near 120°C, with caustic chemicals present. After attempting to determine the root cause of the problem through a series of experiments and analysis, we contacted the Technology Extension Service in August 1993 for assistance. The Technology Extension Service helped analyze the problem and provided timely access to resources required to solve the problem. Among the help provided was:

- access to a scanning electron microscope for analysis of surface contaminants to identify their source,
- provision of information regarding conformal coating processes and the names of several conformal coating experts,
- review of our vacuum and nitrogen purge systems with recommendations for upgrading the systems,
- access to a special Highly Accelerated Stress Test chamber to conduct tests on potential new materials,
- help in the interpretation of data obtained from residual gas analysis performed on the environment inside of our hermetically sealed sensors.

With the help of the Technology Extension Service, we were able to identify and correct several sources of our problem and remain competitive in the market.

Occasion 2 - Improvement of wire-bonding technique

In 1994 we saw an increase in the demand for smaller assemblies which required additional use of wire bond technology in our circuits. We had been performing wire bonding on a small portion of our circuits with a fairly high level of internal product failure and scrap. We did not have enough

experience with miniature circuits to predict the reliability of the end product as volume and applications increased, and we needed to reduce the internal scrap rate to stay competitive. The Technology Extension Service was able to arrange for a wire-bonding expert from the Naval Research Laboratory to review our equipment and procedures and provide assistance in optimizing our procedures. The optimization included the areas of test, handling and storage, burn-in, cleaning, and coating. We now experience a low internal failure rate and have a confidence in the circuit assembly, which allows us to enter additional markets.

Occasion 3 - Product failure due to metallic crystal growth

In 1996 we experienced a high failure rate associated with a portion of our product line. After a period of time, certain components were electrically shorting together which caused circuit failure. Through the use of the scanning electron microscope provided by the Technology Extension Service, we were able to quickly identify the source of the problem and identify alternate materials that would eliminate the problem.

Occasion 4 - Welding & hermetic sealing improvement

To confirm we were using the best practices in welding our product and ensuring a hermetic seal, the Technology Extension Service provided several sources of expert advice. One source was selected and we contracted directly with that person to improve our welding equipment set-ups, evaluate our part design, optimize our helium leak test equipment, and design specialized fixturing.

Occasion 5 - Metalization of piezoelectric ceramic material

Between the years of 1995 and 1999 we experienced significant inconsistency in obtaining adequate metalization of piezo-electric ceramic material used in our product. We had tried several suppliers in the course of reducing the high scrap rate associated with the process, each with mixed results and none who could consistently provide a metalized ceramic. The Technology Extension Service performed a literature search and provided us with a copy of a research paper on metalization of piezoelectric ceramic surfaces, which we were able to pass on to our suppliers. This information was

part of the solution, which helped reduce our scrap and helped our suppliers reduce their scrap and rework.

WILCOXON RESEARCH

Company Description and Personal Biography

Wilcoxon Research, Inc., is a small company that designs and manufactures a wide variety of vibration sensors and associated accessories. Formed in 1960, by former staff members of the David Taylor Research Center of the US Navy, Wilcoxon research, Inc. currently employs about 110 people and sells \$9 million worth of product to laboratories, the US government, and original equipment manufacturers. Our instruments are primarily used in monitoring and measuring vibration in order to control equipment vibration and predict equipment component failure. These instruments allow our customers to reduce their costs and become more competitive through predictive maintenance practices. Typical industrial applications include monitoring paper machine roller bearings, cooling tower fans, power generation equipment, and other continuously operating rotating shaft equipment where unexpected shutdowns due to bearing failure can cause significant disruption and cost to the plant owner. Typical military applications include balancing and monitoring helicopter rotors and monitoring engine components.

John Churchill is the Quality Assurance Director at Wilcoxon Research. He joined the company in 1985 as a technical draftsman and was responsible for developing the company's drafting and documentation departments. In 1990 he developed the Quality Assurance department and in 1998 obtained ISO 9001 registration for the company.

w i l c o x o n

Vibration Sensors and Accessories



The Honorable James Sensenbrenner
Chairman, House Science Committee
2320 Rayburn House Office Building
Washington, D.C. 20515

Dear Chairman Sensenbrenner:

This letter is to inform you that I am planning to testify before the House Technology Subcommittee of the House Science Committee on September 23, 1999 regarding Small Manufacturing and the Challenges of the New Millennium. Neither my employer, Wilcoxon Research, Inc., nor I have received Federal Government funding which directly supports the subject matter on which I will be testifying.

Sincerely,

John Churchill
Quality Assurance Director

21 Firstfield Road
Guthrie, MD 20878 USA
1-800-WILCOXON
Tel 901-330-8811
Fax 901-330-8873
Email: sensors@wilcoxon.com
Web: www.wilcoxon.com

WR WILCOXON
RESEARCH

Chairwoman MORELLA. Thank you, Mr. Churchill.
Mr. Braddock, pleasure to have you with us.

**TESTIMONY OF NORMAN BRADDOCK, PRESIDENT, SAGINAW
REMANUFACTURING, SAGINAW, MICHIGAN**

Mr. BRADDOCK. Thank you. Good morning, Congresswoman Morella and Members of the Subcommittee.

My name is Norman Braddock and I am President of the Saginaw Remanufacturing Company in Saginaw, Michigan. I'm honored to have this opportunity to testify before you today. And I'm especially pleased to testify before my local Congressman and friend, Jim Barcia, and also before Ms. Stabenow, Congresswoman Stabenow, who will become the next U.S. Senator from the great State of Michigan. [Laughter.]

I traveled here to Washington, D.C., to participate in the 1999 Manufacturing Summit. And I thoroughly enjoyed the opportunity to discuss the challenges I face with other small manufacturers, agencies, elected officials and staff. Today I would like to discuss my experience in how the Manufacturing Extension Partnership, or MEP, has helped me address some of these challenges.

After 20 years in General Motors in their manufacturing, personnel and purchasing departments, I established the Saginaw Remanufacturing Company in 1991 as a remanufacturer of hydraulic power steering pumps for General Motors service parts operations, and Daimler Chrysler's Mopar Parts Division. Our product is used in the after-market and is sold to car dealers around the world for service and warranty work. We also provide assembly, sub-assembly, inspection, testing, rework and recycling services to Delphi Automotive Systems in Saginaw for their OEM business.

Today Saginaw Remanufacturing employs 63 people and our sales are expected to exceed \$3 million this year. During my first several years in business, I found it difficult to accurately predict the cost of production, and would often build a cushion into my quotes for particular jobs to ensure that I covered all of my expenses. When I received a flyer from Saginaw Valley State University's Center for Manufacturing Improvement for an activity-based costing seminar, I thought it was something that I had better check out.

CMI is the regional office for the Michigan Manufacturing Technology Center, Michigan's MEP center. Activity-based costing, the activity-based costing seminar, sparked my interest to learn more about accurately calculating costs for each of my product lines. And I wanted to contact the MMTC for more information.

As a result, I contracted with them for \$7,500 and came away with an invaluable insight into the financial breakdown of my business operations. By better understanding how each part of my production process contributes to the overall cost of products, I was better able to predict the cost of new products and provide more accurate quotes to potential customers. I could also identify which jobs were the most profitable and concentrate my efforts on those particular jobs.

I also received assistance with a strategic business plan. I needed that for QS9000 registration. And also, I received market analysis information from the MMTC. I feel that my company is a real suc-

cess story and that the MMTC has been a strong partner in achieving that success. They provided me with expertise that I could not find anywhere else. They are impartial, knowledgeable and they are an ally in today's fierce marketplace. They continue to call with referrals and advice, and have even given me input on contacting other potential customers.

I also want to differentiate MEP services from those from their private sector counterparts. Most large private sector consultants do not actively solicit my business, and when they do, very junior level people have been assigned to perform the work. In addition, the services often were not tailored to fit my particular needs.

The MMTC, on the other hand, aggressively marketed to me and continues to provide guidance about new services and programs that can help me remain competitive. I feel that they are very business savvy and very business conscious, and are truly in my corner.

I have two other challenges I want to briefly mention to you. As many of you know, the big three auto makers are moving from assembling parts to assembling modules of parts, and pushing more and more assembly, engineering and design work to lower tier suppliers. This puts great pressure on small manufacturers like myself to more effectively communicate with my customers and my supplier chain.

In addition, there are more demands to comply with various quality standards and to have more in-house engineering and design expertise. I sincerely appreciate the opportunity to participate in this 1999 National Manufacturing Summit. And while I'm keenly aware of the many challenges small manufacturers like me face, the Summit gave me a chance to interact with hundreds of others who are struggling with these same problems, and have helped us to understand how we might tackle them.

The breakout sessions were right on target. The e-commerce and work force forums addressed some of the specific challenges I just mentioned. I attended the international trade session, and I strongly believe that the future competitiveness will heavily rely on our ability and my ability to conduct business globally and on-line, and obtain accurate, timely information about my customers and suppliers.

It is extremely difficult for small manufacturers like me to wade through the hype about the internet and determine exactly what I need to implement and identify the resources to do it. I look forward to working with the MMTC, and continue to address these new set of challenges.

Once again, I want to thank you for this opportunity to speak to you today and particularly before my local Congressman, Mr. Jim Barcia. Thank you.

[The statement of Mr. Braddock follows:]

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STATEMENT OF
NORM BRADDOCK
PRESIDENT OF
SAGINAW REMANUFACTURING

FOR
A HEARING ON SMALL MANUFACTURING AND THE
CHALLENGES OF THE NEW MILLENNIUM
BEFORE
THE HOUSE TECHNOLOGY SUBCOMMITTEE
OF THE HOUSE SCIENCE COMMITTEE

THURSDAY, SEPTEMBER 23RD, 1999

Good afternoon Chairwoman Morella and members of the Subcommittee. My name is Norm Braddock and I am President of Saginaw Remanufacturing in Saginaw, Michigan. I am honored to have the opportunity to testify before you today and I am especially pleased to testify before my local Congressman and friend, Mr. Jim Barcia, who so effectively serves as Ranking Minority Member on this Subcommittee.

I traveled to Washington, D.C. this week to participate in the 1999 National Manufacturing Summit and I have thoroughly enjoyed the opportunity to discuss the challenges I face with other small manufacturers, agency and elected officials and staff. Today I would like to discuss my experiences and how the Manufacturing Extension Partnership (MEP) has helped me address some of these challenges.

After 20 years in General Motors Manufacturing Personnel and Purchasing Departments, I established Saginaw Remanufacturing in 1991 as a remanufacturer of hydraulic power steering pumps for General Motor's service parts operations. Our product is used in the after-market and is sold to car dealers around the world for warranty and other service work. We also provide assembly, subassembly, inspection and testing, rework and recycling services to Delphi Automotive Systems in Saginaw. Today Saginaw Remanufacturing employs 63 people and our sales are expected to exceed \$3 million this year. Our sales have increased about \$500,000 per year for the last five years. We continue to expand and have recently purchased a corporate office building and a warehouse facility.

I also employ an additional 75 people through Reman Personnel Services, which I established in 1995 to help find quality employees to work at Saginaw Remanufacturing.

Both companies are subsidiaries of MEDP of Saginaw Inc. (Minority Entrepreneurial Development Project). MEDP is a joint venture between the African American community, Delphi Automotive Systems and General Motors that was created in the early 1980s to provide employment opportunities for minorities in the Saginaw community. I think it is important to understand my background and what experiences I bring to you today. I have been very active with local and statewide economic development agencies. I was Chairman of the Board of Saginaw Future Inc., a local private non profit economic development agency and was recently elected Chairman of the Downtown Development Authority. I was also President of the Saginaw African American and Minority Business Association for two years and I am currently a trustee with the Saginaw Community Foundation and the Bridge Center for Racial Harmony. I currently am a member of the executive committee on the Saginaw County Chamber of Commerce Board of Directors. I served for three years on the Saginaw/Bay/Midland Workforce Development Board and I remain a member of the Governors Workforce Commission for the state of Michigan.

During my first several years in business, I found it difficult to accurately predict the cost of production and would often build in a "cushion" to my quote for a particular job to ensure that I covered all my expenses. When I received a flyer from Saginaw Valley State University's Center for Manufacturing Improvement (CMI) for an activity based costing (ABC) seminar, I

thought I had better check it out. CMI is a regional office to the Michigan Manufacturing Technology Center (MMTC), Michigan's MEP center. The activity based costing seminar sparked my interest to learn more about accurately calculating costs for each of my product lines and I contacted the MMTC for more information. I contracted with them for \$7,500 and came away with invaluable insight into the financial breakdown of my operations. By better understanding how each part of my production process contributes to the overall cost of the product, I was able to better predict the cost of new products and provide more accurate quotes to potential customers. I could also identify which jobs were the most profitable and concentrate my efforts of those jobs.

The ABC system that was best suited for my needs did not require as much implementation time as originally contracted, which left some unused funds when the project was completed. The MMTC gave me an option to receive a refund or contract for additional services. I chose to receive assistance with a strategic plan I needed for QS9000 registration and a market analysis. For those of you who don't know, the Big Three automakers are requiring that all their suppliers be registered as QS9000 compliant. This involves incorporating a quality management system into your operations to help to ensure fewer flawed products and identify those that are flawed before you send them to your customers. Both the strategic plan and marketing analysis have greatly helped me to define the vision for my company and to better plan for the future. I feel that my company is a real success story and the MMTC has been a strong partner in accomplishing that success. They provided me expertise I could not find elsewhere and are an

impartial, knowledgeable ally in today's fierce marketplace. They continue to call with referrals and advice and have even put me in contact with potential customers.

I also want to differentiate MEP services from their private sector counterparts. Most large private sector consultants do not actively solicit my business and when they do, very junior level people have been assigned to perform the work. In addition, the services often were not tailored to fit my specific needs. The MMTC, on the other hand, aggressively marketed to me and continues to provide guidance about new services and programs that can help me remain competitive. I feel that they are very small business savvy and are truly in my corner. They provide a variety of assistance including lean manufacturing, performance benchmarking, training, energy assistance and environmental management programs. They provide one-on-one assistance as well as offer several courses through "user-groups" where several similar manufacturers gather together to discuss common problems or training needs.

I have two other challenges I would briefly like to mention to you. As many of you know, the Big Three automakers are moving from assembling parts to assembling "modules" of parts and pushing more and more assembly, engineering and design work to lower tiered suppliers. This puts great pressures on small manufacturers like me to more effectively communicate with my customers and my suppliers. In addition, there are more demands to comply with various quality standards and to have more "in-house" engineering and design expertise. I also have great difficulty finding and retaining quality employees. As I mentioned earlier, I established a staffing agency several years ago to help address this problem.

I sincerely appreciate the opportunity to participate in the 1999 National Manufacturing Summit. While I am keenly aware of the many challenges small manufacturers like me face, the summit gave me the chance to interact with hundreds of others who are struggling with these same problems and helped us to understand how we might tackle them. The breakout sessions were right on target and the e-commerce and workforce forums addressed some of the specific challenges I just mentioned. I attended the electronic commerce session and I strongly believe that my future competitiveness will heavily rely on my ability to conduct business online and obtain accurate timely information from my customers and suppliers. It is extremely difficult for small manufacturers like me to wade through the hype about the internet and determine exactly what I need to implement and identify the resources to do it. I look forward to working with the MMTC as I continue to address these new set of challenges.

Once again, thank you for the opportunity to speak with you today.

BIOGRAPHY
NORMAN CLAY BRADDOCK SR.
2525 WILLARD STREET
SAGINAW, MI 48602

Norman C. Braddock Sr. is married to Bregitte K. Braddock and they have two children, daughter Teri 10 years old and Norman Jr. 5 years old. Bregitte is a Production Control and Logistics Administrator for Delphi Automotive in Saginaw. They have been married for 12 years and live in the city of Saginaw.

Norman is a lifelong resident of the city of Saginaw and graduated from Saginaw High School in 1969. While working as an hourly worker at Saginaw Steering Gear Division (Delphi) of General Motors he attended Delta College and received an Associates degree in business management.

He has held various managerial positions at Delphi including Manufacturing Supervisor, Workers Compensation Adjuster, Benefit Plan Supervisor, Labor Relations Supervisor, Senior Buyer and General Supervisor of Purchasing.

After working for 20 years at General Motors, he started the Saginaw ReManufacturing Company as a joint venture to rebuild power steering pumps for the aftermarket. As the business progressed he diversified the products to include inspection and subassembly of various other original equipment automotive parts. In 1994, he created ReMan Personnel Services, a staffing agency that supplied people to businesses throughout Saginaw County.

Mr. Braddock is active as a director of various professional organizations including the Saginaw African American & Minority Business Association, Citizens Bank of Saginaw, the Governors Workforce Commission, Saginaw County Chamber of Commerce (Secretary), Downtown Development Authority (Chairman), Downtown Saginaw Association, St. Mary's Hospital Foundation, Saginaw Valley Manufacturers Association, the Saginaw Economics Forum, and the Bridge Center for Racial Harmony.

Norman enjoys family outings, reading, playing basketball and taking long walks with his wife. He is currently a candidate for the local city School Board election scheduled for November 2, 1999.

RESUME

NORMAN C. BRADDOCK SR.
 330 SOUTH WASHINGTON AVE.
 SAGINAW, MI 48607
 HOUSE PHONE 517/792-1206 OFFICE 517/752-4570
 FAX: 517/752-6329
 PAGER 517/201-2498 CELLULAR 517/860-3286

EDUCATION: Associates Degree in Business Management
 Delta College
 University Center, MI

EXPERIENCE:

1991-present M.E.D.P. of Saginaw Inc., President & CEO
 ReMan Personnel Services Inc., President
 Saginaw ReManufacturing Co., General Manager

1971-1991 Delphi Automotive
 Saginaw Steering Systems

- General Supervisor of Purchasing
- Senior Buyer
- Labor Relations Administrator
- Benefit Plans Supervisor
- Manufacturing Supervisor

DIRECTOR

Saginaw African American & Minority Business Association
 Citizens Bank of Saginaw
 Governors Workforce Commission
 Leadership Saginaw Steering Committee
 Saginaw County Chamber of Commerce
 Saginaw Community Foundation
 Downtown Development Authority
 Downtown Saginaw Association
 Workforce Development Board of Saginaw/Bay/Midland
 Bridge Center for Racial Harmony
 St. Mary's Hospital Foundation
 Saginaw Valley Manufacturers Association

Member of the Church of Christ and other community service organizations.



Board of Directors

Norman C. Braddock
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Terry Pruitt

S. Joe Stephens

September 20, 1999

The Honorable James Sensenbrenner
 Chairman, House Science Committee
 2320 Rayburn House Office Building
 Washington, D.C. 20515

Dear Chairman Sensenbrenner

I am writing to notify you that I, as President of M.E.D.P. of Saginaw Inc. dba Saginaw ReManufacturing Company, have received no federal government assistance which is relevant to the subject matter of the Technology Subcommittee hearing on small manufacturing issues scheduled for Thursday, September 23rd. As you may know, I plan to be a witness at this hearing.

I hope this letter complies with the Rules of the House of Representatives regarding public witnesses. Please contact me at 517-752-4570 if you need any other information on this matter.

Sincerely,

Norman C. Braddock
 President/CEO

Chairwoman MORELLA. Thank you very much, Mr. Braddock. Thank all of you for your testimony.

We'll start our round of questions, but, I don't know what's happened, Mr. Braddock, but we have also Ms. Rivers from Michigan. So we've been kind of overwhelmed with the Michiganers here. [Laughter.]

And we also have Mr. Baird, who has joined us, too, from the great State of Washington.

I'm going to start off asking you some questions about yesterday's real standards day as it applies to your response to international standards, whether they are barriers, whether there should be changes, the whole concept of standard setting. I wonder what impact, if you'd like to comment, do international standards have on small manufacturers. Then I want to go into whether or not small manufacturers have difficulty exporting to the European union or elsewhere because of technical standards. And whoever would like to start off, Mr. Jasinowski is in front of the microphone.

Mr. JASINOWSKI. I'm happy to start off from a broad sense. I must say that when you have a discussion of international trade with both large and small manufacturers, standards comes up as a major barrier with respect to trade in Europe. As you know, the trans-Atlantic dialogue in Tab D are focused on those questions at a large company level. And the effort is to try to get the private sector to agree on harmonization of reducing standards that are different in each country, whether or not they are internet standards or tire standards or whatever.

So in a large, generic sense, it is a major barrier to trade, and I think the private sector would like to see them reduced. I don't know if they're particularly worse for small manufacturers, but my sense would be at least in some areas that it is.

Chairwoman MORELLA. Mr. Churchill, do you want to comment on that?

Mr. CHURCHILL. Yes. We have several standards that are applied to our products, particularly to CE standards, with the low voltage directive and the EMI requirements and the ATEX requirements they have. They have put considerable, we've put considerable costs and resources into complying with those standards. It is a little difficult at times to find out which standards we need to comply with.

Chairwoman MORELLA. Are small manufacturers, do you think, represented adequately on the international standard setting boards, or even national, you know?

Mr. CHURCHILL. Yes, I believe so, but I don't have a lot of experience on the representation that's there on the board.

Chairwoman MORELLA. Mr. Braddock, would you like to comment on that, sir?

Mr. BRADDOCK. The international standards I'm most familiar with is ISO9000, International Standards Organization. And the auto industry action group took that a step further a few years ago and created QS9000, which is Quality Systems. And actually, they enhance the ISO9000 standards to make it a little bit more strict, but that's not a problem, because any standardization of standards, whether they be local or international, is a benefit to small busi-

ness and even bigger businesses, because everyone operates out of the same playbook.

And as long as they're fair and objective, small businesses don't have a problem. As a matter of fact, when QS9000 first came out, we agonized over all the work involved in getting registered. Because it requires you to document everything you do, and then prove that you're doing what the documentation says.

And after getting into it, after a few months, I made my organization aware of the fact that whether the customer required us to do this or not, it's still the right thing for us to do, because it gives us, it helps us to franchise the business, it gives us a blueprint, and it forces us to be disciplined enough to do what it is we ought to be doing anyway, do our documentation.

Chairwoman MORELLA. Does the Federal Government have any role to play in assisting small manufacturers on standards issues, or none?

Mr. JASINOWSKI. Madam Chairman, I would like to say that I recall now that we did a survey for the Summit which asked the exact question you have asked. Of small manufacturers, and 50 percent of those answered said that standards were a major barrier to trade. I think that since the big guys are over there taking care of themselves, it remains for NIST, the NAM, the Department of Commerce and those other agencies that represent small manufacturing to raise this as a major issue.

So I would say yes, and all of us need to be very active on it.

Chairwoman MORELLA. And I left the last word to you, Mr. Kammer.

Mr. KAMMER. Thank you. Standards clearly do represent barriers to small companies in the United States. You just have the information barrier, large companies have technical libraries of standards, small companies, you know, simply can't afford the overhead that this implies. One of the roles for the Federal Government is just to provide the information. I think that's a helpful thing to do.

The International Trade Administration estimates that, in addition to the problem just of information gaps, that somewhere between 10 and 20 percent of our trade with the EU, that we would have 10 or 20 percent more trade with the EU if it weren't for the Eurocentric nature of the standards. To put that in perspective, this last year, we did \$400 billion worth of trade with the EU.

So it's a large number.

Chairwoman MORELLA. My first five minutes elapsed, so I will recognize Mr. Barcia.

Mr. BARCIA. Thank you, Chairwoman Morella.

Chairwoman MORELLA. Excuse me, we have been joined by Mr. Udall. I want to acknowledge him.

Mr. BARCIA. Thank you. The first question I have I'd like to direct to Mr. Braddock, but also any comments that any of the panel members would care to make. Mr. Braddock, one of the major challenges facing all manufacturers is developing a skilled work force. You serve back in Michigan on the Governor's Work Force Board. Could you address some of the work force issues facing small and medium size manufacturers and how do you think we could address this issue more effectively?

In addition to training of people new to the work force, would you also address the issue of professional development of the existing work force in terms of keeping their skills current as technology advances and different skills are required in an ever-changing manufacturing environment and how we might address in the long term professional development for small and medium size work forces, and small and medium size manufacturing?

Mr. BRADDOCK. Well, speaking from a practical experience, there is a great demand for high skilled, high wage and high demand people to fill those types of positions. I've somewhat resolved those issues for myself personally by creating another company called Reman Personnel Services, a staffing agency that does nothing but go out and seeks people to fill positions, not only in my business, but also for other local businesses.

And you're right, good people are hard to find, and even to retain good people, you have to treat them fairly, pay them competitive wages and then provide them with some career opportunity once they come in your door, to do other things beyond what they're doing for you. It's an ongoing challenge.

But I think our best solution is to work within the school systems, the public and private school systems, to work with teachers, in order for them to educate our children to be prepared to go to work, not just after high school and not just after college, but through trade schools. Not all children are college material.

So we need to identify early who those children are who need to go to trade school so that we can get more electricians, carpenters, pipe fitters, plumbers, people that, and we need to educate people about, as I learned this week, about manufacturing, and the fact that there are good manufacturing jobs out there in the world that need to be filled. I would venture to say as a parent that if I found out that my son couldn't be a doctor, I'd be just as happy if he could be an electrician working in a manufacturing facility.

Mr. BARCIA. Any other panel guests care to comment?

Mr. JASINOWSKI. I would first of all say how proud I am of Mr. Braddock's answer, since I think he reflects the kind of entrepreneurship that is so characteristic of all of these small manufacturers. My wife and I had dinner with several of them the other night and she said, you know, they are so positive that it just takes your breath away after you've spent time with them.

But turning to policy, two things. One, I think manufacturers can do more themselves. And I have been urging that manufacturers invest 3 percent of payroll in training, and we've created something called a virtual university which now allows us to provide on-line training to our companies. And it has been enormously popular so far. And I think on-line training is going to be a big answer to the problem, because it's much more cost effective and much more flexible.

Second, I think we ought to take a look at tax policy and see if there are incentives associated with training. We have some in the tax law already. We at the NAM are going to be looking at other tax incentives.

Mr. BARCIA. If no one else has anything, I'd just like to follow up, I think on both Mr. Braddock's and Mr. Jasinowski's comments, with the second question. I think you've partially answered it, but

if you have any specific suggestions on what we might do to be more responsive, I would appreciate that. I'll start with Mr. Braddock, but again, anyone that would like to comment, I would appreciate your responses.

Mr. Braddock, e-commerce has become the latest buzz word in Washington policy circles. In your testimony, you mentioned some of the challenges your company faced in going on-line. What kinds of assistance can the Manufacturing Extension Partnership provide to small businesses going on-line? Also, what are some specific examples of how small manufacturers could or would do business transactions over the internet? Could you comment in that regard?

Mr. BRADDOCK. Sure. I, unlike many small manufacturers, I was able to afford to hire a private consultant to help me get an e-mail address and they're working on a web page. And I assume that others who are not aware of the need that I am, because I went to a conference in Orlando earlier this year that said, if you don't have dot com after your name, you're not in business.

The MEP, I think, can provide technical assistance for people who, like myself and others, in order to help us determine first of all, not only how to get on the Internet, but how to use it once you get there, how it can benefit your business. As you may know, you can get on the Internet, but you can waste a lot of time there, or you can take care of a lot of business there.

I think they can help us learn how to train our work force, our people, how to use other private sector consultants, if they're out there, and how to just be able to make money in the e-commerce world. Because obviously, there's a lot of money to be made over the Internet. And likewise, there's a lot of money to be lost if you don't know what you're doing.

Mr. BARCIA. Thank you.

Chairwoman MORELLA. Did you want to comment on that, Mr. Jasinowski?

Mr. JASINOWSKI. Well, I think that the one thing I would add to it is that, I raised at the conference yesterday the need for a Federal web page that would provide information on e-commerce successes to the manufacturing community generally. And Elliott Maxwell, who was there from the Commerce Department, indicated they were working on that. I would just say that this Committee could push the notion of a central place for e-commerce in terms of not policy, but how to succeed in your own business. Between the Department of Commerce and the Extension Program and NIST, I'm sure they can get it on-line soon.

Chairwoman MORELLA. Very good idea.

I'm pleased now to recognize Mr. Baird from Washington State. I don't know whether Manufacturing Extension Center is near you or not.

Mr. BAIRD. I confess I don't, but I'm intrigued by the program, and that's what I wanted to ask about. Thanks, Madam Chair.

This sounds like a pretty good deal. It sounds like a Government program that actually works and we're always happy to hear that we do some good things around here. We hear enough of the negative.

I'm interested, Mr. Jasinowski, does your organization have any sense, or could you estimate maybe the cost benefit ratio that we

get out of this, in terms of from your feedback you may have, or Mr. Kammer?

Mr. JASINOWSKI. Well, I think Mr. Kammer can do better than I. I have to say that historically, we have not been as close a partner of the Extension Program as maybe we should have been, and in some cases, the Extension Program may not have in all cases been quite as strong as it could have been.

I think in the last several years there has been a greater awareness of the potential for payoff. I was just saying to Mr. Kammer that I wanted to send out a letter which had a list of specific examples, like Mr. Braddock and Mr. Churchill was mentioning, in one paragraph, so that more small manufacturers could see specific examples of how things work.

So I think it's good to calculate cost benefit ratios. But I think we're at a point where we're trying to make the marriage more solid than take credit for having lived together for 40 years.

Mr. BAIRD. Good analogy. Mr. Kammer, have you a comment on that?

Mr. KAMMER. Yes, sir. We asked the Census Bureau to survey some of the people that we've worked with. We've worked with about 77,000 small firms at this point. And they did a survey that was 4,400, which we think is enough to draw conclusions from.

And for those 4,400, for the period of the survey, which was one year, 1997, the companies reported increased sales of \$236 million. They also said that they created and retained about 6,700 jobs.

I'm almost brave enough to multiply that by 20, because it was about 5 percent, but not quite. But at least the sign is right, the magnitude is significant. The Government cost on an annual basis is about \$100 million, \$105 million a year. The States then put up the same amount, about \$105 million. And then fees pay the rest of the costs. So it's about 1/3, 1/3, 1/3. And the ratios seem very good.

Mr. BAIRD. What sorts of outreach do you do, Mr. Kammer, with small manufacturers?

Mr. KAMMER. We have about 2,000 technology agents that are supported by this common fund. And they're located in about 400 places. We're in all States, including yours. And if I may, I'd like to share an information package with you later on.

Mr. BAIRD. I was going to ask that, thank you.

Mr. KAMMER. And we visit, we'll call on you directly, we'll go to your meetings of the Jaycees, we'll go to your meetings of the Chamber of Commerce, you know, the traditional ways that people in the United States seem to network and that works very well. You know, we're a good country for that kind of thing.

And we find that this works well. Not everybody's interested in working with us or anybody else in the Government. But when people are, we're happy to work with them. We want to.

Mr. BAIRD. Thank you very much.

I'm going to ask what may seem to be a bit of an off the wall question. But we mentioned earlier the issue of standards. And I'm continually amazed that our Nation doesn't switch to the metric system. And in the issue of international trade, is that a significant obstacle for folks?

Mr. KAMMER. The United States is metric in almost all respects except for the interface with human beings. Your car has metric everything except the odometer, the speedometer and tires. I have a set of old English ratchets that I used to play around with cars, they won't fit on my car now.

Mr. BAIRD. You round the bolts off when you use them.

Mr. KAMMER. That's all you can do with that. But at the retail level, we as a society seem pretty conservative about making the change.

Chairwoman MORELLA. Except we run 5Ks. [Laughter.]

Mr. BAIRD. But how about in the manufacturing realm? Is that an issue for you? Or either, not just in that, but in the work force, having a work force that's savvy on metrics?

Mr. CHURCHILL. It's not been much of a real barrier to us. We often end up with two models of products that are identical except one has metric mounting threads and one has English mounting threads, depending on where we sell it. And it complicates things a little bit in that regard.

Mr. JASINOWSKI. I'd have to say generally that manufacturers have moved to the metric system for the most part, reflecting just what Ray was saying. So you do have a schizophrenic world out there in which a lot of it has happened. But we don't see it, because it's not happening at the consumer level.

Mr. BAIRD. We should keep that a secret, and they'll think we're plotting. [Laughter.]

Mr. BRADDICK. Well, you've heard of bilingual. We're bi-numeral.

Mr. BAIRD. That's very well put.

Thank you very much, Madam Chair.

Chairwoman MORELLA. Thank you, Mr. Baird.

Now I'm pleased to recognize Mr. Udall.

Mr. UDALL. Thank you, Madam Chair. And I want to welcome the panel as well. I thought I would begin by directing a question to Mr. Jasinowski, but if others of you would like to answer it, I'd appreciate that as well.

You, I believe, and I did arrive a little bit late, but stressed that improved efficiency is mandatory, I think was the term you used, in order for a small manufacturer to stay competitive. Improved efficiency, in my experience, can reduce resource used, waste streams and energy consumption, all areas that I'm very interested in. What role do you think the MEP program can play in assisting small manufacturers to increase and improve their efficiencies?

Mr. JASINOWSKI. That's a very good question, Mr. Udall, because it came up at the conference, and we had a whole working session that focused on sustainable development, which was the way the conference labeled the whole effort to try to bring efficiency and environmental excellence together. I think there was a uniform conclusion among the manufacturers, which is important, that the quality movement in this country, which has been so profound in affecting manufacturing processes, have convinced most manufacturers that it's better to eliminate all the waste that you can for efficiency reasons.

And that, by the way, also helps on the environmental grounds, so that our paradigm for production is that small is beautiful in manufacturing, or less is more. Most people don't know that, be-

cause sometimes we're fighting particular regulations because we don't agree with them. But that was the ethic.

And then beyond that, they felt that we ought to try to increase the information flexibility between the regulator and the manufacturer and have more cooperation. And we had a survey showing that 70 percent of the small manufacturers got along fine with their State environmental agency, and only 7 percent felt the same way about EPA. So there's something about the gap in communications, which is fairly profound from the manufacturers point of view, which would generally tend to agree with your paradigm.

Mr. UDALL. So your feeling is the MEP program could help bridge that gap in situations?

Mr. JASINOWSKI. Yes, I think that I should have said explicitly the whole sense was that this was what the MEP could help with in terms of improving that communication.

Mr. UDALL. Anybody else on the panel have a comment in that particular area?

Mr. KAMMER. Perhaps I could also point to the opportunities in better engineering and the supply chain. The supply chain exists when one supplier perhaps provides a compressor, another supplier puts it in an engine, a third person puts it in an automobile, just a kind of a crude example. Most engineers estimate that the waste at this point in the supply chain, because it's not well engineered, the first guy didn't talk to the third guy, he only talked to the second guy, is about 1/3 of the cost.

Well, that's a lot. That's a very fertile area. On the other hand, it's very hard to work in, because the third guy doesn't perhaps even know who the first guy is. And the notion of working on supply chains is one that's in very active discussion within the MEP and among our customers and among the MEP center directors right now.

Mr. UDALL. You may be aware of some of the experiments in industrial ecology that are going on, particularly in Scandinavia. I think there's, the Danes have a very interesting industrial situation where they recycle lots of material, including the waste energy that's used in one production process. And there are some fascinating efforts going on here in the same regard.

Mr. KAMMER. That's an area where, actually there's a lot of operational waste energy sharing now in Europe. And there's hardly any in the United States.

Mr. UDALL. Hopefully we'll have a chance in this Committee to encourage that more in this country, through some of the mechanisms available to us.

I want to just, I have another question, but I also want to just also remark, it's always good to see Mr. Kammer here. We have a NIST facility in my district in Boulder. I continue to be just astonished by the work that you do in such areas as gauging the amount of electricity in a microchip that you can't even see with the human eye, and setting those kinds of standards. My hat's off to the people that work there and the commitment that they have, and also the great addition to our community in Boulder that the facility provides.

I had heard one criticism of the MEP program, and I think Congressman Baird alluded to it, or you mentioned it, there are sites

in every State, is it's not always accessible to small manufacturers. Is that a legitimate concern, and if so, what do you do to respond to that?

Mr. KAMMER. There's 385—yes, it's a legitimate concern. There's 385,000 manufacturers. We've been in existence ten years. We've worked with about 77,000, at that rate in a century, we'll have talked to everybody.

One of the things that we're focused on is trying to find ways to increase the scope. We've got 2,000 technology agents out there. That's a lot. I'm not sure that the next step is to add another 1,000.

Can we work through the Internet? Can we provide more tools such as the Y2K tool that we provided to allow people to self-diagnosis? We reached 300,000 manufacturers, small and medium manufacturers, with that tool, which shows that there are ways to increase our scope. And we didn't add any people in order to do that. So that's one of the notions.

I think in addition to that, there's some practical limitations right now. We're perhaps a few centers short of where we should be, just on geography. We'd like to be no more than two hours drive time from anybody that has an issue. We don't think people get in the car and drive much more than two hours, either our agents or people who perhaps have a problem. And there's a few areas of the country where I couldn't honestly say that we're two hours drive time away.

Mr. UDALL. Thank you. Thank you, Madam Chair.

Chairwoman MORELLA. Thank you, Mr. Udall. You're always true to your heritage, environmentally and in many ways, in the home and the area that you represent. And I'm pleased also to represent a NIST location in Gaithersburg, Maryland.

I was curious, also, and you pretty much answered it, with regard to whether or not there are complaints of people not being close enough, and you talked about sending out the experts, and actually wanting to do more, and having that possibility there. I guess I wanted to pick up on the training programs that you may have. You know, remember we passed the H1B Visa program. And already, it was utilized by the end of May, at the numbers that we had increased of international people who could give us expertise.

Now, this is two questions. First of all, do you find in your work, and just particularly small manufacturers, and I know you would, Mr. Jasinowski, representing all of them, do you find that there is a need for another piece of legislation that would increase that, the number that we allow into the United States for a period of years? And in addition to responding to that, do you have programs where you work with the community, with the colleges, and you know, Mr. Churchill, do you work with our school system in some way on, do you partner in any way with the community college that you have?

I wonder whether or not Mr. Braddock, you utilize our educational network for it. And also, attached to that is the idea of, do you ever talk to counselors in high school about manufacturing jobs? You know, I think, Mr. Kammer, I think NIST gives an award to some of these high school kids who are involved in manufacturing.

I remember one year contacting one of them, he said, you're like the first one who even gave any recognition other than a little blurb in the newspaper for this. And I just think that we just don't let young people know that there are these jobs available.

So I guess I'm talking about training personnel, the further need to go outside the United States for experts, whether temporarily or long into the future. Whoever wants to start off.

Mr. BRADDOCK. I mention in my testimony that I became aware of the Manufacturing Technology Center through Saginaw Valley State University, the extension of the MEP in Saginaw. Likewise, I've been very active in the community, I encourage children to come through my plant on tours, I've spent a lot of time in the metal schools and the high schools, local high schools. Matter of fact, I'm a candidate for local school board.

And I know that we need to educate our children on manufacturing and manufacturing jobs, and to expose them at an early age of what manufacturing is all about. So that's been on my agenda since day one for the last 10 years. And it does make a difference. It makes an impact for kids. A lot of kids, even if their parents work in a plant, don't know what the inside of a plant looks like. So they've had an opportunity themselves to come in and take a look at it.

Chairwoman MORELLA. It just occurred to me, you need to educate parents, too. Many of us think Harvard, Yale, you know, we just don't want anything that deals with manufacturing. Have you found that to be the case, too?

Mr. BRADDOCK. Oh, definitely. I mentioned earlier that many parents expect their children to graduate from high school and go on to a four year college and graduate, be doctors, lawyers and whatever. But the trade schools offer just as much opportunity for children to become electricians and skilled trades people that we need in manufacturing.

I will mention that one of the ongoing concerns right now, for small manufacturers, is the fact that there's not just a shortage at our level, but also at the large manufacturing level. What typically happens is they use us as a feeder program, and they take our skilled trades people and advance them up, which leaves us having to be a training ground for the larger manufacturers.

So there's all the much more need for us to have a feeder system and our best feeder system is through the high schools, the trade skills, and to identify early who these kids are, get them in apprenticeship programs so that there is an abundance, if not an abundance, at least an adequate supply of people that we need in order to keep our business running.

Chairwoman MORELLA. Mr. Churchill, I'd love to hear from you.

Mr. CHURCHILL. Yes, we do have difficulty at times finding qualified people to join our organization. Particularly in the more experienced and more technical qualifications, not necessarily people directly out of a school situation.

We have worked with or participated in job fair programs at Montgomery College, the local community college there. I believe we've had some success there with the entry level type technicians and some assembler applications there. And we've also worked a

little bit with Maryland University on some co-op type programs to help bring in some people.

The type of technology we employ is a little unusual for this area, I believe. I believe that's why we're having difficulty finding qualified applicants. And you can get a lot of computer people and military type applicants here. We're more into analog and more hand assembly work here. It is a difficulty we have.

Chairwoman MORELLA. Mr. Jasinowski, I know, since you do large and small, maybe you want to address the issue.

Mr. JASINOWSKI. Well, I did want to, from a small point of view, because I think that if anything, Mr. Churchill understates a little bit the severity of the problem. The survey we had showed 83 percent have a problem finding skilled workers. And at the conference, people just were talking and talking and talking about how impossible it is, that they're giving bonuses, that they're going out and dragging them in from the street in order to get it.

So I think it's a severe skill shortage right now for small manufacturers. And they're scared to death, because they're afraid the large guys are going to take their people anyway.

So I think that we must have a renewal of the H1B and we must do better on the education front, because our labor force is slowing down, and we still have 30 or 40 percent of the people who apply for manufacturing jobs can't meet the tests of basic mathematics and critical thinking. So I think it's a severe problem.

I think at the same time manufacturers have got to get into the schools and help solve the problem themselves better. And I was just thinking that last year, we gave an award to members of Congress for what we called manufacturing legislative excellence, which means you voted our way. And we went in your district and we gave them out.

But I am thinking maybe we ought to give an award for cooperation in the education system. And bring the schools in, do the plant tours and somehow involve members of Congress in that. We've got to somehow make this more politically profitable to everybody involved.

Chairwoman MORELLA. It's a great idea. I like it.

Any comments you want to add, Mr. Kammer?

Mr. KAMMER. I think several. I don't think our society for the most part realizes that manufacturing jobs pay 12 percent more than service jobs. And if you were making a choice and you could have a lifetime 12 percent pay raise, I think I know what most people would choose. But they're not knowledgeable and, therefore, they're not motivated.

About 20 years ago, the common wisdom was that 5 percent unemployment was the irreducible minimum on employment rate, that 5 percent was sort of the component of our society that wasn't educable, or wasn't motivated. We're at 4.6 percent I think this month on unemployment, so we've sort of broken that barrier. But no wonder there's a lot of pressure. There's so many, there's a lot of jobs chasing relatively few people.

I personally think one of the big issues is increasing the skills of our population, so that they can do the more sophisticated jobs, so that they can partake of higher paying jobs. The Baldrige award just this last year, with the permission of Congress and this

Committee, added education as a new category. I have some optimism that that will ultimately have the effect on our K-12 as well as our colleges, but most importantly, K-12, that we've had in manufacturing. If that were to happen, it would be a wonderful boon to society. But we will see, we've just started.

Chairwoman MORELLA. I guess the bottom line continues to be education, education, education, basic skills, letting people know what the opportunities are, doing the mentoring, getting out there, working in partnerships. I will now recognize Mr. Gutknecht has joined us, and I want to now recognize Mr. Barcia for a second round of questioning.

Mr. BARCIA. Well, I appreciate the testimony we just received, also, because I want to highlight and thank you, Chairwoman Morella, for agreeing last year to graciously hold a public hearing in my district in Bay County, on the campus of Delta Community College, Delta College.

And Mr. Braddock, I'm not sure if you've interfaced with college officials, but we kind of during that public hearing highlighted the success of the advanced technology education component of the National Science Foundation, in which Delta College administrators and faculty have designed specific curriculum to impart the skills, training and education necessary for our two-year community college students to go directly into the work force.

We had three major manufacturing companies, Dow Corning, Dow Chemical and General Motors, who testified as to the success of that interaction between college administrators and faculty, designing the specific curriculum and classes that are needed with the latest state of the art equipment in the plants, so that when that student graduates, after two years of higher education, they go directly into the work force, and in some cases making between \$50,000 and \$60,000 a year to start.

And I think what we might want to do in Congress is see how we can reinforce the financial resources of NSF with regard to the ATE component. And then also, I'm not sure, Mr. Braddock, if you've had any contact with Delta College up there in terms of helping train some of your future employees, or retrain existing workers.

Mr. BRADDOCK. Being a graduate of Delta College, in 1991 the first 15 people that I hired went through an extensive training program at Delta. They spent four hours in the classroom and four hours in the work place as part of the startup of my business that long ago. So I've had a long term relationship with Delta.

But let me also say this, is that we have a vastly underserved population of people in our communities, particularly in the minority community, who are underemployed, who need training in order to access even entry level positions in most manufacturing facilities.

And even though manufacturing can range anywhere from making furniture to making rockets, it's not all rocket science. Once people have gotten in the door, proven themselves to be good, get to work on time, proven that they have some good work ethic, you can typically train the average person to do whatever it is they need to do, as long as they're willing to show up every day and be

on time and then pay attention to what it is they're supposed to be doing.

So I think it goes back to the whole point of education being the key, and letting people know that if they do the right things, they'll have an opportunity to get a better and better job as time goes on.

Mr. BARCIA. I'm not sure if anyone else wanted to comment, but again, I want to thank Chairwoman Morella. I think we had a very successful public hearing on the campus up there last spring, and a lot of these points that Mr. Braddock just made were demonstrated in terms of the testimony that was provided to our Subcommittee. So thanks.

Chairwoman MORELLA. Demonstrates the kinds of things that can be done throughout the country with partnerships between the educational institutions and the private sector to train young people.

I'm delighted now to recognize Mr. Gutknecht from the great State of Minnesota.

Mr. GUTKNECHT. Well, thank you, Madam Chair. And I apologize for not being here. We had another hearing going on over in the Budget Committee on the issue of education. And we were privileged to have Governor Jeb Bush from the State of Florida testifying, former Governor Voinovich from the State of Ohio testifying.

And it was interesting, when you have people from Ohio, Florida and Michigan involved in the debate, sooner or later there was some discussion of football. And it was interesting, and I was privileged in a previous life, I worked for the former captain of the Green Bay Packers. It's a long way to go to make a point here, but one of the things that struck me and in some of the things that you've said, and I will take more time to review some of the testimony about education, training and so forth.

The one thing about Vince Lombardi, he had a relatively small playbook. But he believed in doing a limited number of things but doing them extremely well. And it seems to me, and this came out sort of in the testimony about education as well, sometimes we've gotten so sophisticated, we've tried to do so many things in education, that we've forgotten some of those basic fundamentals.

I think you've alluded to this, that if kids have basic skills, if they can read, if they can write, if they can perform arithmetic, if they've got good English language skills, it strikes me that even small manufacturers, and I do an awful lot of plant tours in my district, and I'll tell you, I encourage all members to do this, because it's amazing to see what's going on in American manufacturing.

You raised the issue of 4 percent unemployment rate. In our district in Minnesota, it is about 2 percent. Literally, we are beyond full employment. I mean, there are people working in my district who really don't want to work. They're literally going out on the streets, you know, and I literally had talked to people at church, and they say, well, yeah, I really didn't want to go back to work, but they kept calling me, so I'm working 28 hours a week, or I'm working 30 hours a week or I'm doing something else.

But anyway, I really do think at some point we do have to get back to some of those basics. And I think sometimes with education, we miss the real story.

In terms of more sophisticated training, I will tell you, every business that I talk to, they say, if you give me somebody who will show up on time, who has a good work ethic, who can read, write, perform arithmetic and has, in fact, they don't even have to have great English language skills, I mean, if they have just basic English language skills, we will train them. And within a relatively short period of time, they will be making a good living in manufacturing.

And I don't so much have a question, and I see for the record the heads were basically nodding on my last comment, they don't have to respond to that. But I do think it's important for hearings like this, and we need to be talking about how important manufacturing is to our long-term economy. I think there is a school of thought, and we need to do all we can to dissuade people from this way of thinking, that manufacturing is not important to our long-term economic future.

The service industry is wonderful. Even high technology is great. But I think at the end of the day, we have to recognize that manufacturing has to be part of our whole economic mix.

And so I'm delighted that you're here. I apologize, I missed most of the testimony and as a result, can't even ask a particularly good question, because it may already have been asked.

But again, I want to thank Chairwoman Morella for putting this hearing together, and I want to thank all of you for coming. And don't think just because we didn't have a huge attendance that members don't care about this. It's just that they have a wicked, sort of a wicked habit around here of piling meetings on top of meetings.

But thank you very much for coming.

Chairwoman MORELLA. Thank you, Mr. Gutknecht. Maybe you didn't ask questions, but you made good statements. I couldn't agree more.

I just want to ask one kind of final question. Mr. Churchill and Mr. Braddock, where would you be today if you didn't have the Manufacturing Extension Program? I notice Mr. Davis, who's a former member of Congress, who's sitting over there, too. Nice to see you.

Mr. CHURCHILL. That is a little hard to answer precisely. But the Manufacturing Extension Program has helped us greatly. As I mentioned earlier, one of the problems we had to solve represented about 50 percent of our sales at that time. And the effect of even losing that market, the reputation would have affected other markets we were in as well.

So I would say they helped greatly in keeping us where we are.

Chairwoman MORELLA. Would you have gone to an independent contractor, or a consultant?

Mr. CHURCHILL. We attempted to go to independent contractors prior to contacting the Extension Program Service. They are difficult to find, and also the speed at which we needed to find them was critical, too. And the ease of being able to call up the Extension Service, once we found out about their services, was greatly appreciated. We could call them up and then in a matter of days, Mr. Vinicor would come back with some help.

Chairwoman MORELLA. Mr. Braddock, do you echo that?

Mr. BRADDOCK. Yes. It's a pretty easy question for me to answer, because as Congressman Baird was asking a question on how we quantify, how would you do a cost analysis of the benefit, I was sitting here thinking that my sales are more than doubled since partnering with the Michigan Manufacturing Technology Center.

And when I think about the services they provided me, if I had to go out there and get those in the private sector, and I have done some private sector consulting, I'd probably have to pay twice as much and get half as much benefit from it, particularly when you, my experience has been with private consultants is you sit there and you tell them everything you know about your business and what it is you do, and then they give you a report that tells you basically what you told them. No real ideas come out of it.

And what I've found with the Michigan Manufacturing Technology Center is that they do research and they contact their other business contacts and they come back with ideas that you can choose, pick and choose from and actually make good, sound business decisions on. And I'm fortunate to be in a position where I can make those decisions in my business very quickly, based on the information that I get from various sources. And that's my biggest challenge, is to make the right decisions.

But the better information I have, the better resources I have, the better decisions I can make.

Chairwoman MORELLA. Excellent. Good. You've offered some great commentary and responses to questions, Mr. Braddock. We're pleased to have you here, I'm very proud of you. And Mr. Churchill, I look forward to also going through your plant, Wilcoxon, at some point.

Mr. CHURCHILL. Oh, yes, we'll invite you.

Chairwoman MORELLA. Mr. Jasinowski, please know, I read your testimony, I mean, I know what you said about the estate tax. [Laughter.]

And the other taxation, I guess R&D would be the, to make permanent, something I agree with, to make permanent the tax credit. And I thank you for your leadership in the entire area. NAM has made a big difference, including in helping to crack that Y2K bill that passed. So it's a pleasure to have you here.

Mr. Kammer, we keep giving you more and more responsibility and you keep being able to, with your very loyal staff, to be able to fulfill it. And this is another area where you've done such a great job, with the MEP program. And I thank you all. And if we have questions from the Subcommittee, we'll be happy to get them to you, if you would be willing to entertain them.

And I want to thank Terry Fish for being such a great staffer, helping with this program and also Mike Quear, on the minority side, for the work that he has done.

And so I thank all of you. Our Subcommittee meeting is adjourned.

[Whereupon, at 2:35 p.m., the Subcommittee was adjourned, to reconvene at the call of the Chair.]